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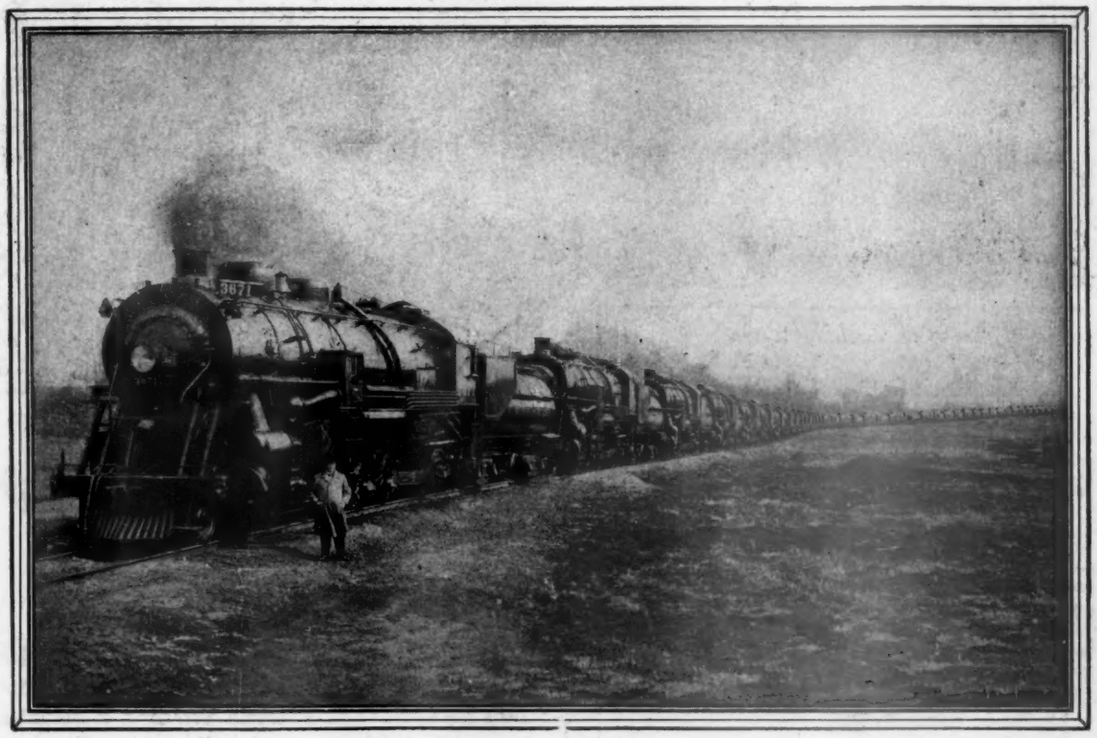

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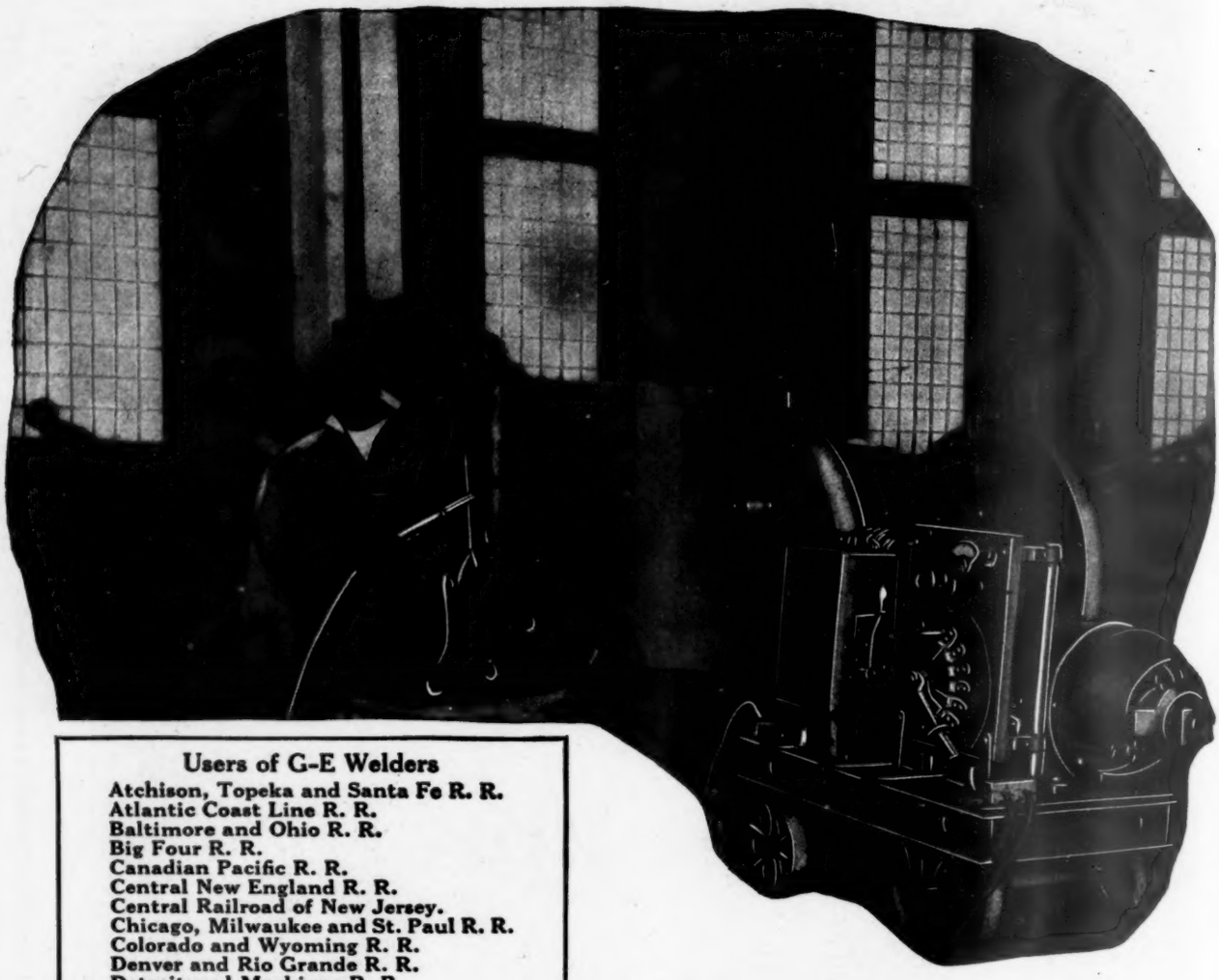

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EDITORIAL

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The Letter of the Law

At the initial fall meeting of the Western Railway Club, reported elsewhere in this issue, the members evinced strong interest in problems of personnel and public relations and the following case was cited as a good example of how *not* to increase the popularity of the railroads: About 150 commuters were waiting at a small station outside of Chicago for the 7:25 morning train to the city. This train arrived on time but access could not be gained to it on account of a long freight train which stood at the station. The passenger train pulled out about one minute before the freight moved, leaving the commuters standing there with feelings which can be more readily imagined than expressed. The 8:05 train arrived but was held up by a defective locomotive and the commuters had to wait for a slow local train leaving at 8:25. The last straw was added to the camel's back when the 8:05 passed them on the way to the city! Without going into the technicalities of the case, the conductor of the 7:25 may have been obeying the letter of the law in refusing to hold his train one minute until the freight cleared, but he certainly antagonized, and it would seem to a fair-minded man, needlessly, 150 all-year-round patrons of his road. The circle of influence of these men could not fail to be extensive and the railroad in question was damaged in the eyes of the public to a proportionate extent.

Cross Tie Preservation Pays

One of the most valuable contributions to the technical program of the Roadmasters' Convention held in Chicago this week, was the paper by S. D. Cooper, assistant manager, treating plants, Atchison, Topeka & Santa Fe, in the form of a brief outline of the Santa Fe's practices in the treatment, care, and distribution of cross ties, together with the results which have been obtained through consistent conformity with an established policy in this regard over a period of 37 years. Divested of its technical details, the story is simple. The Santa Fe commenced the treatment of its cross ties in 1885 and in the 37 years ending in 1922, had subjected 70,499,756 ties to preservative processes. At the inception of this program in 1885, the average tie renewals were 336 per mile. In 1922 the average renewals were only 158. In other words, treatment and the proper use of treated ties effected a saving of 178 ties per mile, or a reduction of more than 3,000,000 ties in the annual cross tie requirements for the 17,100 miles of track on the Santa Fe System. This conclusion makes no allowance for the enormous increase in the average traffic per mile of line, or the fact that the ties used in 1885 probably included a much greater proportion cut from woods more resistant to decay in the untreated condition than would be the case with the average run of ties now available. But the results obtained by the Santa Fe are not the fruit of any halfway measures. They have been brought about only through consistent conformity with a well-defined policy, covering not only the selection of sound timber and careful supervision of the treatment, but also the protection of the ties against mechanical destruction through a liberal use of tie plates and a well-considered plan of distribution whereby each tie is subjected to the service for which it is best adapted. These results are another indication of the principle that what is worth doing is worth doing well.

The Impossible Accomplished

When the railways adopted their program of transportation efficiency early last April, the goal of 15 per cent unserviceable locomotives they set to be reached as of October 1 seemed, if anything, rather too ambitious to be possible of realization. On April 1, the number of locomotives held for repairs requiring over 24 hours was 12,801 or 19.8 per cent of the number of locomotives on line. On Monday of this week announcement was made that the goal had been reached on September 1—one month sooner than the program called for. On September 1, the number of locomotives held for repairs requiring over 24 hours was 9,392 and the percentage of the number on line was 14.7. The railroads had on line on September 1, some 700 less locomotives than they had on April 1, this representing the excess of retirements over additions of new power due to the substitution of the new and larger units received from the builders. On the other hand, the number of locomotives serviceable on September 1, was 3,300 greater than on April 1, the actual figure for September 1, being 53.438 as compared with that for April 1, of 50.107. The number reported serviceable is the largest ever reported since the beginning of the compilation of the locomotive equipment condition data by the Car Service Division. The railroads have been storing serviceable locomotives for some time, their improved equipment conditions permitting the establishment of a reserve of this kind in spite of the heavy traffic which they have been handling. The number stored on September 1, was 2,714, representing a progressive increase from the figure of 914 on April 1. The A. R. A. transportation program is being carried out in rather satisfactory manner. One of the principal reasons for its success is the improvement in the motive power situation.

The Traffic Test of Track Capacity

During periods of maximum traffic the track capacity of any line is limited by the ability to move trains through the sections of most serious congestion, such as long grades, short stretches of single track through tunnels or over bridges, and at yard entrances. It is only at times of unusually heavy traffic that the most acute delays result from the bunching of trains at such points. Therefore these points of trouble should be located *now* so that it will be possible to relieve the congestion next year by making a short installation of signals to permit the closer blocking of trains in the vicinity of limited track capacity or by the adoption of other expedients. Signal officers should be directed to stay out on the line constantly during this season to co-operate with local operating officers in locating and studying the conditions that are now limiting the train movements at these troublesome points. Several roads are following the practice of signaling the most congested portions of single track lines first before covering

the entire division and as the present volume of traffic offers such an unusual opportunity to locate these "bottle necks" it would seem logical that studies should be made *now*.

The Recent Valuation Reports

THE INTERSTATE COMMERCE COMMISSION recently has rendered reports placing "final single values" on two railroads—the Atlanta, Birmingham & Atlantic and the Los Angeles & Salt Lake. These are the first true final valuations it has placed upon any railways. The reports will be studied carefully and thoroughly by everybody who is really interested in the subjects of valuation of railroads and public utilities and will be the cause of long, animated and even heated discussions.

The principal impression made upon the mind of a thoughtful reader by his first reading of the reports is likely to be that this great problem of railroad valuation is very far from solution. The La Follette law requiring a valuation to be made was passed ten years ago. The commission has been carrying on its investigation and studying the data resulting from it ever since. There can be no serious question that its members desire to make a valuation which will be in accordance with the law and just to both the railways and the public. If there is any small body of men who might be expected to agree upon the factors that should be considered in the valuation of a railroad and the weight that should be given to each of them, it is the eleven members of the commission.

The reports show, however, that there are the widest differences of opinion among members of the commission. In the Los Angeles & Salt Lake case, besides the majority report there were rendered separate reports by Commissioners Hall, Daniels, Potter, Eastman, Cox and Meyer. Some of them concurred in part and dissented in part, while others dissented from some of the most important parts of the majority report. Virtually, the same thing occurred in the Atlanta, Birmingham & Atlantic case. There was nothing approaching unanimity of opinion as to the weight that should be given to original cost of construction, or to cost of reproduction, or to other elements of value. The commissioners did not even agree as to the dates of the unit costs which should be used in arriving at cost of reproduction. Their differences of opinion amounted in money to many millions of dollars in the case of each of these small properties.

The differences of opinion among the commissioners make painfully plain that the whole question of valuation will finally have to be fought out in the courts. The mass and complexity of the data that must be considered, and the practical impossibility of separating questions of law from questions of fact show that the courts have a herculean task ahead of them.

One of the most important questions involved was whether the commission should base the valuation of a railway as of June 30, 1914, on the unit costs of labor and materials prevailing at that time and then bring the valuation up to date by adding the actual investment that has been made since that time, or should give consideration—but not controlling consideration—to the present cost of reproduction at the unit costs which have prevailed since wages and prices were greatly advanced as a result of the war. The majority report indicates that the commission gave some consideration to up-to-date costs, but that what it actually did was to ascertain the value as of June, 1914, on the basis of the unit costs that prevailed at that time, and then find the present value by merely adding the investment made at the higher costs since 1914.

Some of the commissioners, especially Mr. Daniels, vigorously dissented from this method of making an up-to-date valuation. They maintained that in arriving at a valuation for rate-making purposes the up-to-date cost of reproducing the entire property—that part of it created before 1914 as well as the part of it created since 1914—must be considered. All the members of the commission have had opportunity to read recent important decisions of the Supreme Court in important public utility valuation cases in which the question of the weight to be given to up-to-date costs of reproduction has been considered. They have a right to place their own interpretation upon these decisions. If, however, these decisions do not mean that the cost of reproducing the entire property at recent unit costs must be given weight, then we are unable to understand the English language. If that is what these decisions of the Supreme Court do mean, then the commission's method of arriving at these final values is very defective.

Unless all signs fail it will be a very long time before the commission will be able to substitute final valuations of all the railways of the country for its "tentative" valuation as a basis for the regulation of rates.

The Situation of the Western Roads

ONE OF THE MOST outstanding features of the present railroad situation is the contrast between the comparative prosperity that is being enjoyed by the railways of the eastern and southern territories and the real adversity which is still being suffered by the railways of western territory. In the first seven months of this year the railways of the Eastern district, including those of the Pocahontas region, earned at the annual rate of 6.59 per cent upon their valuation and those of the Southern district at the annual rate of 6.64 per cent. These railways earned a wholly inadequate net return in 1921 and 1922, and they would have to continue to earn at the present rate for a long time to compensate them for their losses in the recent past. But the western railways also earned very inadequate returns in 1921 and 1922, and unfortunately they have continued to do so in 1923. The return earned by them on their valuation in the first seven months of this year was at the annual rate of only 4.17 per cent.

It is plain that the western lines cannot go on getting such poor financial results without serious consequences both to many of them and to the people of the territory that they serve. Therefore, it is time there should be more study of the reasons why they are making such a poor showing.

As has been indicated in the *Railway Age* heretofore, one of the important reasons why they are doing so poorly is that as a result of the way in which advances and reductions of rates have been made within recent years the increase now shown in their average freight rate, as compared with their average rate before the war, is less than the increase in the average rate shown by either the eastern or southern lines. In all the statistics of the Interstate Commerce Commission until recently the railways of the Pocahontas region were included in the Southern district. In the first six months of 1923 the average revenue per ton per mile of the railways in the Eastern district was 76 per cent greater than in the year ended June 30, 1913. The average revenue per ton per mile of the railways of the Southern district, including the Pocahontas region, was about 44 per cent greater than ten years ago and that of the railways of the Western district only about 38 per cent greater.

But there is another and even more important reason why the western railways are earning such a poor net return, both absolutely and relatively. This is that although both the eastern and southern lines have had a much larger freight business thus far in 1923 than in 1920, the freight business

of the railways of the Western district has been substantially smaller than in 1920. It was constantly argued after the big decline in traffic which began late in 1920 that the advances in rates had killed freight business. One recalls this argument with some amusement when he finds the facts show that the largest increase in business since before the rates were advanced has occurred in eastern territory, where the advance in the average rate has been the smallest.
est; that the second largest increase in freight business has been in southern territory, where the advance over pre-war rates has been the second greatest; and that an actual decline of freight business is shown in the Western district, where the advance in the average rate has been the smallest.

The accompanying table shows the increases and decreases in revenue tons carried one mile by the railways of the various regions and districts in the first six months of 1923 as compared with the first six months of 1920.

CLASS I ROADS

Revenue Tons Carried One Mile

	First six months, 1920	First six months, 1923	Increase per cent first six months, 1923 over first six months, 1920
Eastern District—			
New England Region....	5,193,102,000	5,427,436,000	Inc. 4.5
Great Lakes Region....	32,936,296,000	40,220,937,000	Inc. 22.1
Ohio, Indiana, Allegheny Region	45,668,554,000	52,633,816,000	Inc. 15.2
Pocahontas Region.....	12,166,365,000	13,360,412,000	Inc. 9.8
Total Eastern District.	95,964,317,000	111,642,601,000	Inc. 16.3
Southern District.....	25,282,522,000	27,808,284,000	Inc. 10.
Western District—			
Northwestern Region....	24,136,136,000	23,459,467,000	Dec. 2.8
Central Western Region..	30,886,110,000	27,577,950,000	Dec. 10.7
Southwestern Region.....	14,423,226,000	13,277,520,000	Dec. 7.9
Total Western District.	69,445,472,000	64,314,937,000	Dec. 7.4
Total United States.....	190,692,311,000	203,765,822,000	Inc. 6.8

The number of tons carried one mile increased in the Southern district, and in each region of the Eastern district, the increases varying from 4½ per cent in the New England region to 22 per cent in the Great Lakes region. On the other hand, there was a decrease of 7.4 per cent in tons carried one mile in the entire Western district, and a decrease in each of the three regions of the district—Northwestern, Central Western and Southwestern. If the western lines had enjoyed as large an increase in their freight business as did even the southern lines, their total freight earnings in the first six months of the year would have been about $140,000,000 larger than they actually were. These larger earnings, in spite of the additional operating expenses that would have been incurred, probably would have enabled them to earn relatively as large a net return as the railways of the other two territories.

The facts show that the eastern and southern lines have been operated this year with remarkable efficiency. Otherwise they could not have handled their largely increased traffic as well as they have. There can be no serious question, however, that the western lines could have handled equally well a relatively equal increase of traffic, and that they are suffering more from insufficient traffic than from inadequate rates.

Why does the freight business of the western roads show an actual decline as compared with 1920 while that of the other railways shows an increase? Doubtless the adversity from which the farmers of a large part of the west have been suffering is one of the explanations. The comparatively low prices they have been getting for some of their products and the comparatively high prices they have had to pay for most of the things they have had to buy has reduced their purchasing power and affected business in all lines, thereby indirectly curtailing freight business.

But there has been another influence operating which probably has been even more potent. It makes very little difference to the eastern lines whether freight from eastern territory moves to the Pacific coast via the Panama canal route or over the transcontinental railroads, for they get to haul most of it either way; and it is actually to their advantage for freight from the middle west to move via the canal route. On the other hand, it makes a very great difference to the western lines which way it goes. They get a maximum haul on traffic moving to the Pacific coast all-rail, and therefore every ton of this traffic they lose has a relatively large effect on their ton mileage. Now, traffic via the Panama canal has increased greatly within recent years, and in consequence the western lines have lost a relatively large amount of business they otherwise would have secured.

Various expedients for improving the net return being earned by the western lines have been considered. The best way for all concerned to solve the problem would be to adopt measures which would increase their traffic. The traffic experts of the western roads believe this would be accomplished to a substantial degree by allowing them to reduce their rates to meet water competition on the Pacific coast without requiring them to correspondingly reduce their rates to intermediate points. The Interstate Commerce Commission thus far has forbidden this policy. Nobody would be harmed by its adoption, although many communities believe they would be harmed and would oppose it. To continue the present policy of so regulating the western lines, both as to prevent them from participating in traffic in which they ought to be allowed to participate and restrict them to rates which are not sufficient to enable them to earn an adequate return from the business they are able to get, is, in effect, to continue a policy of confiscation. The situation presents a problem which it is the duty of the Interstate Commerce Commission to study and help solve.

Electrical Maintenance Combined

VARIOUS PLANS for combining the maintenance of telegraph, telephone, signal and electric lighting facilities are being tried on several small roads and on at least one large system. As an example, on one western road operating some 1,500 miles of line, the maintenance of the signal, telegraph, telephone and station lighting facilities is handled by one set of men. Since direct current signals are used and the telegraph, telephone and signal control wires are all carried on the same pole line, the signal maintainers can inspect and repair all of the wires readily. The signal maintainers have also been trained gradually to handle the average maintenance work on the inside telephone and telegraph apparatus, while a special division inspector does the testing and makes the complicated changes and adjustments of the communication facilities.

The real test of the efficiency of the combined maintenance occurs during a general storm. At such times the maintainers on this road are instructed to re-establish the telephone train dispatching circuits first, even at the cost of cutting in some of the signal control circuits as telephone lines. Having established dispatching service the maintainers next turn their attention to the signals to secure at least a permissive indication. By this system, with a man on every 15 or 20 miles of line, it is possible to restore both the line of communication and the signals to service with fewer train delays than if separate forces were employed and a single lineman had to care for the communication lines on an entire division. The contract with the telegraph company on this road requires that the railroad shall handle the maintenance; the accounts are therefore somewhat simplified, although separate charges are made daily by the maintenance forces.

With the long established custom of providing separate forces of maintainers for signals and of linemen for the communication facilities, well prepared plans and keen judgment of men are necessary when inaugurating and developing

a combined maintenance force. The program cannot be established over night, but may well be started by degrees on a branch line where, for example, there may be an outlying interlocking or a small signal installation and perhaps a few highway crossing signals. On such a line the telegraph lineman and the signal maintainer are both required to spend a large part of their time traveling to maintain a small amount of apparatus distributed over a long territory and it is logical to raise the question whether half of the traveling may not be eliminated, and quicker repairs made possible in case of trouble by shortening the territories. The most serious problem is to find the men who are willing to learn the operation of a few more electrical devices. However, the results are worth the effort and deserve serious thought and planning.

Divergent Opinion in New England

THE INTERSTATE COMMERCE COMMISSION will, in the near future, begin its hearings in Boston, Mass., on the plans proposed for the disposition of the New England carriers in the railway consolidation plan. It is to be expected from what has already taken place, that the commissioners in attendance will be presented with a problem of exceeding intricacy because of the many conflicting opinions that will unquestionably be presented. There is no section of the country where the problem of railway consolidations has been receiving more attention than it has in the New England states. Interest in what may become of New England's rail carriers in the consolidation plans is sufficiently widespread and acute that it is not an exaggeration to say that the railway question is one of the leading public issues of the day in the six New England states.

There are several reasons why the discussion evolving about the railway consolidation question should be receiving more attention in New England than it is receiving elsewhere. One of these is the manner in which the problem has been formulated into a clean-cut issue between those who favor consolidation of the New England carriers into a New England system, and those who would prefer that the various New England roads be taken over by respective trunk line carriers. A second reason is the widespread belief in New England that that section has not for some time been served adequately by its railway transportation facilities. Agitation about this situation has been of long standing. It goes back at least to the time when Charles S. Mellen was carrying out his ill-fated plans looking to the aggrandisement of the New Haven and subsidiary properties of various sorts into the control of which the New Haven management ventured. It is quite natural that the discussion of the consolidation plans should have resulted in a revival of the discussion concerning adequacy of service, especially since the consolidation question has been brought to the front at a time when the New England shippers and the public generally remember so clearly the difficulties of securing service during the congestion which resulted from the railway shopmen's strike last summer and fall, and from the severe weather conditions of the first quarter of the present year.

As the discussion has continued, there has been more recently a tendency to emphasize New England's financial interest in its railways. The New England roads are owned mainly in New England. A large share of the securities are in the vaults of trust companies, savings banks and insurance companies. Owners of these securities bought them at high prices and have had to write off large losses as the securities have depreciated in value to abnormally low levels. The financial interest of the individual security holders and that of a large share of the New England public, as represented in the investment of their saving deposits or insurance premiums in New England railroad securities must, of course, receive its due consideration in the problem as a whole. It is apparent that New England does not feel optimistic about the financial prospects of its railway lines. It is not possible to believe that it can feel otherwise in the face of the present low prices which are being quoted on the various New England railway bond issues.

It has been pointed out many times, and from many angles, that New England is especially dependent upon efficient railway transportation service. New England industry produces high-grade commodities which naturally need high-grade transportation service, especially in the case of that share of the production which is sold in markets distant from New England, and which comes in competition with the production of centers nearer at hand. It receives most of its fuel and raw material from the outside, although a fair share is delivered by water, either from coastwise points, or, as is instanced by a large share of the wool, rubber, hides, etc., from foreign parts. Factories can not operate efficiently without a continuing and certain supply of raw material and fuel and this, shippers contend, they too frequently have not had.

This, then, is the background against which the problem of railway consolidations is receiving consideration in the New England states. In most other sections of the country the discussion surrounding railway consolidation has engaged the participation of railway men, and speaking generally, it has been a matter of somewhat secondary consideration to the public. This is not at all the case in New England. The public, public authorities, organizations of shippers, etc., have joined with the railroads in placing the problem before the public eye, making it noticed, one of the leading issues before the public in the New England states today.

It is to be expected that adequacy of railway service, financial interest of the investor, individual or otherwise, as well as the many conflicting plans for correcting New England railway conditions will all be referred to in the Interstate Commerce Commission hearings otherwise intended to consider only the allocation of the New England roads in the railway consolidation program. Professor Ripley, in his report on consolidations, presented tentative suggestions covering both a New England system and trunk line affiliation. At the hearings in Washington some months ago, the trunk line executives did not express themselves as being overanxious to take on respective New England lines tentatively assigned to them. The New Haven executive, President E. J. Pearson, stated at the Washington hearings, preference for a New England system. The Boston & Maine is on record as preferring trunk line affiliation, although at some future time when more favorable earnings will permit more advantageous terms of union than will be feasible at this time. The Maine Central has expressed its opinion in favor of union with the New York Central and a taking over of a division of the Boston & Maine to secure the necessary physical connection.

The various New England public bodies have expressed various opinions, which opinions have been guided by the New England attitude towards New England railway service. The most important of these bodies to have expressed an opinion is the so-called Storrow committee, which might properly be termed a quasi-official body because it was chosen by the governors of the New England states. The committee after a year's study of the situation presented recently a strong plea for a New England consolidation. It offered a plan to carry out what it termed the rehabilitation by cooperation of New England roads. Unfortunately its findings have instigated considerable discussion which threatens to border on the acrimonious because of the criticisms that were made of the operating efficiency of the New Haven and the Boston & Maine. The New Haven directors have approved the Storrow committee findings in favor of a New England

system. Officially they have adopted a waiting attitude as to the methods proposed for financial rehabilitation. Their reply to the criticisms of operating efficiency and the committee's use of statistics was a pointed criticism to the effect that the committee's findings were not correct.

The Boston Chamber of Commerce has recently conducted a referendum vote which decided by three to one in favor of a New England system. It is impossible as yet, however, to determine whether New England public opinion is predominantly of that opinion.

It is difficult at this stage of the proceedings to hazard a suggestion as to what may be the ultimate outcome of the involved situation which has arisen with reference to the New England railroad situation as a result of the opening for public discussion of the problem of railway consolidation. It is to be hoped that out of the present volume of discussion there will come something of practical value towards a solution of the present unsatisfactory New England railway transportation situation. It is hard to believe that New England industry can long continue prosperous if a satisfactory solution is not found in the near future. There may be some good in the fact that this is realized in New England states and that all interests concerned are lending their efforts to the end that accomplishment of some kind may follow.

New Books and Special Articles of Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Railroad Malaria Surveys 1922. *The Missouri Pacific Railroad,* by A. W. Fuchs. U. S. Public Health Service Bulletin No. 135. 36 p. Published by Government Printing Office, Washington.

Regulation and Management of Public Utilities, by Charles Stillman Morgan. Hart, Schaffner & Marx Prize Essay No. 34. 362 p. Published by Houghton, Mifflin Co., Boston and New York.

Periodical Articles

The Coal Question, by Walter S. Tower. How it affects rail traffic, and internal and international problems in various countries. Foreign Affairs, September 15, 1923, p. 100-116.

German Railway Rates Increase, by Orsen N. Nielson and E. Verne Richardson. Tables showing freight rate increase from Nov., 1921, to December, 1922, and passenger fares as of August, 1923. Commerce Reports, September 17, 1923, p. 728.

In-Breeding is Bad for Railroad Stock. Editorial comment on New Haven's recent message to stockholders. Collier's, September 22, 1923, p. 18.

Influence of Terminal Design on Initial Investment and Operating Expenses, by H. McL. Harding. Estimate of average costs of units. Shipper & Carrier, September, 1923, p. 321.

The Kansas Industrial Court Act as Affected by the Wolff Packing Company Case, by William L. Huggins. Law & Labor, September, 1923, p. 240-244.

Lake Transportation a Preventive of Car Shortage, by H. S. Noble. Shipper & Carrier, September, 1923, p. 320.

Railroad Development and Indispensable Service. Editorial comment on railroad accomplishments and the public's attitude. Commercial & Financial Chronicle, September 8, 1923, p. 1058-1060.

The Transcontinental Rate Situation, by W. H. Kieffer. Effect of Panama Canal Competition. Trade and Transportation Bulletin, September, 1923, p. 7.

Letters to the Editor

[*The* RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.*]

Train Control Not in Experimental Stage

CHICAGO, Ill.

TO THE EDITOR:

American railway students are inclined to assume that American railroads are superior to the British, and that nothing can be learned from British experiences in rail transportation; and the American railway economist finds a considerable satisfaction in a comparison of the relative costs of producing transportation in the two countries. There is no more convincing language in which to express general superiority of our American railroad art than in the relative costs of the ton-mile. Certainly the American public, served by our railroads, might be in a worse economic position. Every American railway man may well be proud of the American railroad machine, of which he is a cog. But this does not in the least justify any cessation of vigilance concerning the expenditures of any department of this transportation system of which we are so proud. We really have much to learn and there is no economy in ignoring the experience of our European friends. Even some recent improvements in our steam locomotives have been employed a long time in Europe.

Take the case of automatic train control: In America there has been too much speculation concerning the effect on railroad economics, and on train operation in particular, and not enough attention to fact. Most of us were young when the Great Western of England installed the electro-mechanical ramp type of automatic train control. It has been many years since members of the train control board of our Interstate Commerce Commission went to England, where they saw this system in operation. Recently the Great Western signal department, the engine drivers, and other employees who were interviewed by the writer spoke enthusiastically about the control. Naturally the drivers disliked the word "automatic stop" and dwelt more on the facility with which trains could be run even when semaphores were obscured by bad weather. The signal department claims that the device, installed on 99 locomotives, is giving very satisfactory service, and, had the war not interfered, they say that most of their main line would have been equipped by this time. They emphasize the necessity for simplicity if satisfactory operation and maintenance are to be had.

A vast traffic is handled at the Great Paddington station and to be without the aid of this control would doubtless be very uneconomical to both the railroad and its patrons. This road operates very fast non-stop passenger trains with slip coaches at the rear for passengers destined for intermediate stations.

It appeared to the writer that the bristling array of semaphores on posts at the side of the right-of-way might be so confusing to drivers that the train control would be peculiarly helpful; for, of course, only the signal for the one track is repeated in the locomotive from the ramps. Even with three-position semaphores or light signals the American engineman seems to have plenty of trouble some-

times in finding which of the many signals applies to him. The British are watching with interest the three-position signals of American manufacture now in use at Victoria Station, and some of their signal engineers expect to adopt three-position semaphores eventually.

The American railway man who "sees American" first, last and all the time, will find that here in our own country a road with comparable experience with automatic train control has the same favorable report to offer. There is no need to speculate; the facts are at hand. A simple train control is a good investment.

P. X. R.

A Prosaic View of the Causes of Smash-Ups

WASHINGTON, D. C.

TO THE EDITOR:

"A railroad is haunted by danger for every foot of its length." This wise saying, coined, I supposed, by some poetic person who flourished early in the Victorian era, is quoted in your issue of September 15, where you comment on the collisions of various trains, fast and slow, which happened on the railroads of the United States in the second quarter of the present year. While I would not for a moment discourage the recognition of poesy in railroading—we need more of it—I beg to submit that in this case you have perhaps gone too far; have given a one-sided view of the dangers of railroading. That time-honored phrase would picture some malign spirit—or, spirits, 33 of them to every rail—crouching at the roadside ready to jump out and knock off the track any train that might come along with even the slightest element in its make-up not in perfect order. The most innocent and efficient railroad president or locomotive runner must naturally shudder when he hears such an implication concerning his behavior.

In point of fact, however, as the context of your article shows, there is no "haunting" whatever; at least not so far as that quarter's record shows. Those 16 investigations, summarized by you, show as plain as day that the trouble in practically every case lay in the intellects of the human beings—enginemen, conductors, superintendents and so on—who were involved, excepting the one collision due to a maliciously misplaced switch. The seeds of the disasters existed in the brains of the men *before* the trains in question had reached the place where they were wrecked. Even in the case of the derailment at Durand, where the track was very weak, and where, if anywhere, your maxim would apply, it seems to be quite clear that very poor judgment as to the safe speed limit—to use no harsher term—was the real immediate cause.

It will be profitable to examine for a moment those varied exhibitions of human frailty.

The first case is Shenandoah, the collision where three or four men who should have kept good lookouts on locomotives kept none at all. At Copeland, the conductor and flagman of a freight train neglected to protect themselves, as required by very simple rules; and the station agent neglected to maintain a 10-minute interval. At Jersey City, it would seem that a signal maintainer probably was at fault.

At Bond's Mill a conductor and an engineman were very slipshod in their methods of handling train orders; a trainmaster allowed habitual disregard of rules. He evidently depended on printed notices, posted on a bulletin board, to take the place of real and effective instructions. At Hammond, the engineman was careless; and the fireman was green, implying carelessness in the office where he was selected, or where he was appointed for this run.

At Grassy, the engineman evidently ran at high speed with a tender known to be unsteady. At Detroit two firemen were negligent in the matter of keeping a lookout; two enginemen "misunderstood" a signal plainly visible. The report raises the presumption that in this case the railroad companies did not provide signals of the best type.

At Oakland, four men responsible for seeing that their train met another train at the proper point, were oblivious of the meeting point.

At Selden, an engineman approached a station at uncontrolled speed when, because of fog, he could not (or did not) see the landmarks. At Greenwich there was an unfaithful oiler. In the Chicago case, an engineman, racing with another train, did not heed the advice of his conductor to slacken his speed.

At Danville, an engineman ran his train across the track of another road oblivious of a stop signal.

What a startling aggregation of undisciplined minds, when you come to focus the light on the whole of them at once! The two derailments (which I have not listed) undoubtedly might be added to the same category, if we could search the operations of the rail mills, the wheel foundries and the car shops.

If any such thing as a being with the evil eye is haunting the railroads of this country it is, I think, fair to conclude, from this record, that instead of being concealed in the bushes by the roadside, as would be suggested by your simile, he, more likely, will be discovered solemnly sitting, like Poe's raven, on some elevated perch in the directors' room!

C. A. H.

Better Training for Enginemen

HARRISBURG, Pa.

TO THE EDITOR:

I read with much interest the editorial in your issue of September 8, "Watch for the Exceptional Case." The number of enginemen who, though they may be capable in most of the duties and responsibilities that go to make up their work, are deficient in actual knowledge of the machines they are handling, is not as small as we would like to believe—and in justice to the men this, perhaps, is not to be wondered at.

In former days when the engines were much smaller and less complex, and when the enginemen were not so much restricted as to what constituted their duties, the average engineman knew his machine and could, in emergencies, make many repairs on the line and help himself and his train out of difficulties, which, occurring today, mean a tie-up. I know of these things, first, because of what I have learned during my railroad experience of over 50 years, and, second, because my family—father and four sons—were railroad men, my father and oldest brother being enginemen.

Because of this, I have for some time held the opinion that on account of the great changes in locomotive construction, before a fireman is promoted to engineman he should be required to serve not less than two months in the shops—the time to be divided between the enginehouse and the back shop. While this experience would not make a shop craftsman of him by any means, I am certain that it would give him a good working knowledge of his engine as a machine and not simply as something that can be made to go—which, by the way, is the trouble with the great majority of automobile drivers of today.

With the large locomotives of today, not a great deal of actual repair work can be done on the road as was done in former times, but, knowing his machine and locating the cause of the trouble, he might be able to do something, and could, at least, give the train movement officials intelligent advice as to the trouble.

A. D. S.

Coal Commission Reports on Transportation

Urges Better Use of Facilities Currently Available Rather Than Their Expansion to Meet Peak Demand

WASHINGTON, D. C.

A CHANGE IN THE SYSTEM of rating coal mines for the purpose of car distribution, to give first consideration to the commercial ability of the producer to sell coal rather than to ability to produce and load it into railroad cars, is recommended by the United States Coal Commission in its report to the President and Congress, dated September 20, on suggestions as to the remedy for irregular production in the bituminous coal industry. Such a change, the commission says, will furnish the economic incentive for regular off-season purchase and storage of coal by the consumer, thereby promoting better use of the available transportation facilities, and by thus increasing the length of the average working year for the mine and miner, with reduced costs of production and prices to the consumer. The commission also urges a readjustment of freight rates to bring about a practice of supplying coal markets with the coal nearest to the markets in cases of substantial similarity in the grade and quality of coals available, urging that this, by minimizing unnecessary and premature development, will operate in the same direction as the first recommendation and at the same time accomplish savings in the cost of transportation.

The commission also finds that doing away with assigned cars will not appreciably increase the total transportation the railroads can offer the soft coal industry. It agrees with the Interstate Commerce Commission that the practice should be done away with, but says there should be a substitute method of meeting the requirements in a less objectionable way.

Causes of Shortages

Widespread strikes and lack of railroad transportation to carry the peak load in times of extreme demand are the two factors that alone are responsible for the serious shortages of bituminous coal in this country that have several times occurred since 1915, the commission says. The capacity in mines and mining labor is sufficient to produce at least 25 per cent more than the highest rate attained in periods of peak demand, and if demand were spread evenly over the year, the overdevelopment would be even more pronounced.

The causes and avoidance of strikes are discussed in another chapter of the commission's report and a very considerable part of this chapter is devoted to a discussion of problems in the transportation of coal. The commission does not recommend the plan of seasonal coal rates which has often been advanced as an incentive to a more even distribution of coal production and dismisses the suggestion that railroad facilities should be developed to a point where they would always be capable of accommodating the peak demand.

The report points out that the facilities of the railroads have not been sufficient in the past eight years to transport as much coal per week as at times the consumers of the country wanted and as the mines were able to dig and load into railroad cars and it says that "it is likely that were there never any limitation on production imposed by lack of transportation there would be little or no overdevelopment in the coal industry because prices would never rise above the competitive level that obtains in periods of full car supply," but that "such a cure for the overdevelopment of the soft coal industry and for such prices for coal would simply transfer to the railroad industry the overdevelopment and necessarily increase freight rates."

"It is estimated," the report says, "that it would cost the railroads two billion dollars to build their facilities up to the point where they could carry the peak loads of coal. This would represent an average carrying charge alone, with interest at 6 per cent, of 40 cents a ton on commercial shipments of bituminous coal. Such a solution of the problems of the coal industry could be considered only if none other were possible.

"The alternative is better use of the transportation facilities currently available. This means simply the more uniform movement of coal throughout the year. Since the fall of 1922, the railroads have furnished transportation for a production of between 10,000,000 tons and 11,000,000 tons of bituminous coal per week; that is from 500,000,000 to 550,000,000 tons per year, which apparently at this time is sufficient for the country's requirements and exports. This has not been accomplished without special effort. The railroads must be expected to expand their coal carrying facilities in step with the expected increase in the nation's coal requirements but they, in return, should not be permitted to dissipate their efforts in needlessly long hauls of coal.

"Operating to hinder the uniform purchase and movement of bituminous coal are the seasonal character of consumption and the fluctuations in consumption attending changes in industrial conditions. A further factor, not so important as it was before 1917, is the national habit of buying soft coal as needed, instead of storage against future needs. Large scale strikes, either at mines or in railroads, of course, are positive bars to production. It is obviously impracticable to legislate in the direction of forcing the uniform purchase and transportation of coal. The only remedy lies in furnishing an economic incentive to off-season purchase and the consequent storage at the point of consumption of bituminous coal, *at the proper seasons.*

"Irregularity of demand is the primary cause of present conditions. The habit bred and grew at a time when the development of the railroads was at least as advanced as that of the coal industry, if not more advanced. The practice presented no difficulties. That time has passed, but in the transition there has been no change in the method of business looking to changed conditions, only rules designed to prevent unfair discrimination.

"The fact of irregular demand due to seasonal consumption alone offered incentive for development of soft coal mines in excess of average requirements. If the country called for a maximum tonnage in November, there was a market in November at least for that maximum output, and mines were opened to meet that demand. The periodic good market in fall and winter offered profits. Development, from keeping pace with the country's growth however, grew to overdevelopment as other factors were brought into play.

"Among the more important of these factors contributing to overdevelopment prior to 1916 even beyond peak demand, were periodic regular strikes in the organized fields. These strikes came with such regularity that their effect was anticipated. Consumers, particularly the railroads, bought heavily in advance and stored coal to tide them over the strike. This meant a season of very active demand which encouraged development of new mines.

"To these causes are to be added the persistent seeking by railroads and by coal operators in the past 30 years, for markets for the newly developing fields south of the Ohio river. In the early 90's the Pittsburgh field supplied 35 per cent of the total production of the Appalachian fields shipping to the Central West and Northwest; and the West

Virginia fields shipped 15 per cent. Competition offered by the southern fields has cut Pittsburgh to 25 per cent in the past five years and raised West Virginia to 32 per cent of the total.

"Overdevelopment has its evil consequences on the industry itself. It is the cause of the average short working year for the capital invested and for the mine worker. Both have come to expect and to demand a full year's wage for little more than two-thirds of a year's work. This is the waste, that profits neither the mine owner nor worker, that the public is called on to pay for as the cost of overdevelopment. The soft coal buyer actually does pay that part of it that is represented by the higher unit wage of the worker due to short time employment. The consumer is only prevented from paying the full amount that capital would collect by the fact of active and sometimes ruinous competition.

"The consequences of overdevelopment can be avoided only by removing so far as economically possible the causes that have produced it. Overdevelopment will then diminish to the economic minimum.

After discussing the history of the overdevelopment of the coal industry and of the growth of the problem into one of national proportions the report continues in part:

Car Shortages

The railroads were and are equipped to carry a normal tonnage of coal from the mines to market. Nearly 90 per cent of the soft coal produced requires transportation to markets away from the mines, and 97 per cent of the transportation is by railroad. Transportation, therefore, may limit production. When it does, there is said to be a "car shortage," though the deficiency is often as much in locomotives as in cars and the trouble often is due to congestion in railroad yards and terminals. The car shortage results in a coal shortage. The rising price of coal furnishes the incentive for the opening of new mines and the reopening of old ones. Whereas there had been less than 300 new mines opened per year in the 6 years prior to 1916, there were 454 new soft coal mines in 1916, 1,285 in 1917, 1,573 in 1918 and 1,058 in 1919. Each of the going mines sought to enlarge its capacity. Coal buyers placed orders, wherever they could, often duplicating, sending agents out and giving employment to a host of new coal jobbers and brokers. As more mines demand cars, the railroads being bound by law to parcel the supply without discrimination, the older mines are given less. The only way to get more cars is to increase mine capacity and thereby become entitled to a larger proportion. The result of this method was that when every operator made this endeavor none could profit much thereby.

Normally between ⅔ and ¾ of bituminous coal is sold on contracts, for the most part covering a year, usually from April 1 to April 1. Prior to 1917 shippers had little difficulty in fulfilling their contracts as the only interference was from an occasional brief car shortage. The major strikes that affected large areas were discounted in advance and no contracts made over their duration. However, the car shortage that began late in 1916 were severe enough to cut down the output of individual mines and thus reduce shipments on contract. Receipts of contract coal were also reduced because some shippers, lured by the higher prices in the spot market, failed to ship coal in accordance with their agreements. The net result was a wild scramble for free coal—that is, coal not under contract. Later in 1917 the government fixed prices but it was not until April, 1918, that the distribution mess was cleaned up.

Assigned and Private Cars

Out of all this confusion there emerged the assigned car, railroad and privately owned, and the consumer-owned mine. Since with recurring car shortages there was no assurance of getting full delivery on contract coal and at such times the open market price on free coal was high, the railroads resorted to a device known as the assigned car to get their fuel.

The railroads would make agreements with mine operators to give a specified mine a full quota of cars in which to load railroad fuel. Such a mine, of course, worked all day every day. It attracted the best labor in the field, it had the lowest cost because of full time operation. The railroad cars given to mines for loading railroad fuel on the assigned car basis were taken from the available supply before distribution was made to other mines shipping commercial coal.

Coal cars had for years been owned by a few soft coal producers. Shipping their own coal in their own cars was a part of the service these few companies gave their customers. For a few the advantages even in times of car surplus were sufficient to warrant the heavy investment. The advantage became great in times of car shortage, for the producer with a sufficient supply of his own cars was independent of the railroad supply and could operate his mines more nearly to full time.

Coal of suitable quality is the most important raw material of railroads, public utilities and of certain industries, as iron and steel. The first step of this important class of users toward stabilizing their fuel supply was the purchase of development of coal mines. The number and capacity of consumer-owned mines has increased notably in the past six years. In 1920 the production from these mines represented some 25 per cent of the total output of soft coal. But owning the coal mines is not in itself assurance of a fuel supply. When transportation is abundant the consumer can obtain coal to his liking without difficulty and at reasonable price, and at such time his ownership of mine may be of doubtful advantage. If the consumer requires 1,000 tons of coal per week and develops his mine to produce that quantity, he will find his supply reduced in times of car shortage to whatever percentage of car supply the railroad may allot the mines. To get 1,000 tons per week he may find it expedient to increase the capacity of his mine to 2,000 tons per week, so that if car supply falls to 50 per cent, he may still get his 1,000 tons of coal.

To overcome this difficulty some consumers likewise have their own coal cars. Under the rules that have obtained in the past, but which the Interstate Commerce Commission changed in its decision of June, 1923, on assigned and private coal cars, these private cars could be given to the mines in any quantity, regardless of how meagre the supply of railroad owned or "system" cars might be. The consumer owning coal cars, with or without his own mine, has been in a favorable position to get coal at any rate he desired, regardless of "car shortage." A number of railroads not reaching the coal fields have bought coal cars to send to mines on other roads exactly as public utilities or industrials have done.

The private coal car has been a good investment in the past six years, because of the extended periods of "car shortage." On the other hand the growth of the practice of assigning cars, both railroad for fuel coal, and private, has worked to the disadvantage of producers and consumers not in position to avail themselves of this form of favored car supply. Large public utilities, for instance, have taken the position that the character of the service they rendered the public is as essential as that of the railroads, and that they should be allowed to have "assigned cars" from the railroad supply, to protect shipments of coal to them purchased under contract.

The inequalities introduced by the assigned car are illustrated by the figures for the Pennsylvania Railroad in Pennsylvania. In 10 months of 1920 the commercial mines, that is those depending on their distributive share of railroad cars, received 50 cars for every 100 they ordered. The mines getting assigned cars, of course, received a full supply. If all cars had been evenly distributed, each mine would have had 69 cars of each 100 ordered. That is, the commercial coal mines lost 19 out of every hundred cars ordered that assigned car mines might have full time. In September, 1922, one-fourth of the coal cars on this road were assigned; in January and February of 1923, two-thirds of the cars were assigned. In February, commercial operators were receiving 18 cars out of every 100 ordered.

The Interstate Commerce Commission decided in June, 1923, that the practice of assigned cars, railroad or private, is unfair and has ordered it discontinued.

Doing away with assigned cars will not appreciably increase the total transportation the railroads can offer the soft coal industry. Having no assigned cars will not ease the problem of those consumers that must have large regular supplies of coal. Unfair as it has been found to be, the assigned car was an effective prop on which a growing number of consumers were coming to lean. The reason of course was the protection of supply coupled with assurance of lower price. There should be a substitute method meeting these requirements, but without the objection of the assigned car practice.

Commercial Ratings Recommended

The Commission recommends that in the future in determining the rating of a mine for the purpose of car distribution, consideration should be given to the commercial ability of the mine to sell its production as well as to its physical capacity to produce. In the years before the war certain of the important coal loading railroads in this country at one time or another did give consideration to commercial ability as well as to physical capacity. In some instances both factors were given equal weight. In other instances one or the other factor was given a weight double that of the second. In the course of the development of coal car distribution rules during the war and post-war periods, reliance upon commercial ability to sell and ship coal was discarded. This was perhaps a natural result of the fact that over a long period during these years there was a ready market for practically all the bituminous coal that could be produced and transported. But in the future when in the face of the existing state of the industry it

may be expected that there will come long periods when the market cannot by any means absorb the potential production, there is good reason for again considering commercial ability to sell as well as physical capacity to produce bituminous coal, in determining the rating of a mine for car distribution purposes. The commission's recommendation is that in determination of such ratings in the future, the commercial factor should be given a controlling influence.

The commission understands, of course, that the primary duty to determine a just and reasonable rating lies with the railroad which distributes the cars. But in our opinion, if the railroads for any reason are slow to adopt the method of rating here suggested, the principle is of sufficient concern to justify investigation of the entire subject by the Interstate Commerce Commission on its own motion to the end that just and reasonable and otherwise lawful methods of rating and distribution consonant therewith may ultimately be established.

Study convinces us that action along this line is necessary to effect relief to the industry and to the consuming public. Such a system of distribution of coal cars would certainly: Furnish incentive to the producer to operate during dull seasons, and thereby more evenly distribute the transportation load throughout the year. Furnish incentive to the consumer to buy and receive coal above actual current requirements in dull seasons and thereby more evenly distribute the transportation load throughout the year. Remove the incentive to secure preference in the use of transportation facilities at certain periods by the use of the assigned car, either railroad or private. Mitigate the effects of coal car shortage by reducing car shortage in amount because leveling out demand and production, and taking the pressure off the spot market in times of car shortage by permitting continuous performance on contracts.

The practical effect of a system of distributing transportation based on ability to sell coal together with ability to produce would be—To straighten the production curve, leveling off peaks and filling valleys not only of the industry as a whole, but of individual mines. To reduce the opportunity for the sporadic opening of speculative mines. To increase the opportunity for regular operation and thus reduce the cost of production, and on the average the cost of coal to the consumer without undermining the profits of those operators who elect steady business at moderate profits as against intermittent operation at speculative profits. To reduce the existing overdevelopment of the industry and curtail unnecessary development. To promote consolidations for the purpose of marketing; that is, the grouping of smaller producing units for selling purposes. (This would advance cooperative marketing, already under way for years in certain fields.) To increase the transportation and thereby the production of coal in times of severe car shortage by reducing at such times the number of mines to be served with cars. To increase the average days per year the miner is given opportunity to work.

The proposed factor of commercial car rating should not be based on contracts between buyer and seller. The proposed ratings should be determined by quantity of coal shipped during the last protracted period of car surplus, whether the shipments were on long time or short term contract or spot sale. It is expected that it would be to the mutual advantage of buyer and seller to engage in at least 12 months contracts under such a system enabling the seller to move the coal in the low market season and the buyer to insure a supply guaranteed as to price and tonnage in times of car shortage and higher prices.

To administer such a system of car ratings would require that the railroads maintain no more records than they now have. A weekly or monthly summary of tons shipped from each mine, or by each group of mines operated by the same company in the same field would be the base for the commercial rating. For the capacity rating necessary to govern distribution of cars available over and above those required to fill commercial ratings, the records now maintained as the base for rating mines would be used.

The introduction of the commercial factor in rating mines is not open to objection on the score of discrimination. The producer, large or small, has equal opportunity to take advantage of the system. The private coal car owner should be permitted to use those cars continuously throughout the year, but should have no advantage over the shipper in system cars if there were a shortage of transportation facilities other than of cars. The rules by which the commercial factor is applied should be designed so as not to encourage ill-advised competition through reductions in wage scales.

The change suggested in the system of rating mines may require some modification of the Transportation Act.

General Conclusions of A. R. A. Committee Approved

Transportation is the all-important link tieing up the coal mine to the consumer. Of the total coal shipped from the mines, railroads originate 97 per cent and the remainder leaves the mine by water carriage. Of the total that is shipped from the mines by rail or water, 75 per cent enters interstate or foreign commerce or is used by railroads. The steam railroads consume 27 per cent of the total bituminous coal produced and coal represents from 35 to 40 per cent of the aggregate freight tonnage of all carriers. Transportation service to the hard coal mines for years has caused no complaint; the transportation problem in coal is confined to the bituminous industry and the discussion here relates to that subject.

At the beginning of the work of the coal commission the railroads, through their national organization, the American Railway Association, were asked to answer the question "Why have not the railroads at all times been able to meet at once the maximum demands of the bituminous coal industry for transportation?" In response the American Railway Association through a special committee submitted to the coal commission a preliminary report on January 3 and a final complete report on June 1, 1923.

Considering the question of transportation service entirely apart from rates or the railroads as consumers of coal, it is apparent that the bituminous coal industry has expanded more in the past 10 years than has the railroad industry. This is true with respect to coal consumption and strikingly so with respect to coal production capacity. The railroads, as they acknowledge, are not able to handle the peak loads of soft coal transportation such as have been offered in recent years.

Locally, it is found that the relative development of railroad and mine capacity have not progressed in consonance with the national aggregate. In some areas and on some roads the mine capacity is more than double that of the railroad serving that area to take away the coal; in others the two are practically matched. Thus on the Pennsylvania System in Pennsylvania we find a wide disparity between mine and railroad capacity and an essential parity on the lines of the New York Central in the same territory. South, the developed mine capacity on the L. & N. and on the C. & O. far exceeds the railroad capacity to serve those mines, whereas the N. & W. has kept pace with mine development.

We can subscribe to the conclusions of the American Railway Association committee as quoted below. There are additional points, however, considered in these reports in which more is to be said. Among these are assigned and private cars, railroad fuel storage, mine car ratings, relation of railroads to overdevelopment of the soft coal industry, coal purchasing policy of the roads, in transit rates on stored coal and coal coked at intermediate points, and rates.

The conclusions of the Conference Committee of the American Railway Association follow:

"There can be no doubt that the railroads of the United States are vitally interested in the work of your commission. It has been said that the principal problem of the coal industry is the problem of distribution. Without committing ourselves to the absolute correctness of this statement, we are sensible of the fact that the coal industry cannot be put upon a sound basis acceptable to the American people unless coal is transported with reasonable promptness and in the most efficient manner. It is the task of the railroads to furnish this transportation. This task has been rendered difficult by certain features characterizing the production of coal which your commission thoroughly understands and which all students of the problem are endeavoring to eliminate.

"It is clear that if some method could be devised whereby the amount of coal which the country demands could be moved throughout the year in fairly constant quantities so that heavy seasonal movements would be avoided, the railroads of the country are sufficiently equipped to take care of the demands upon them in a satisfactory manner. Even if allowance is made for an increased demand for coal during the period of heaviest domestic consumption the railroads could meet the situation without serious cause for complaint. But the railroads do not feel that they are properly censurable for not being able to meet all the demands for transportation in years when strikes in the coal industry have stopped production for a considerable period making it necessary to crowd a year's business into a few months and that too at a time when there is the heaviest movement of other seasonal commodities.

"Of course, the undertaking of the railroads to meet demands upon them must depend upon the ability of the railroads to increase their facilities as the business of the country increases. These facilities cannot be procured without the expenditure of new capital which must come from the investing public. It is clear that capital will not be attracted to railroad securities unless there is a reasonable assurance that the investment is safe.

"These considerations lead us to suggest, as we have already suggested in our preliminary report, that there are two fundamental conditions which the public must establish before the problem of distributing coal will be solved. These are, first: fair treatment to the railroads under which they will be permitted to earn a fair return upon the value of their property fairly ascertained, and second: freedom from strikes, both in the coal and railroad industry, so that these two essential businesses may function without disturbing interruptions."

When there are not sufficient coal cars to supply every soft coal

mine all that it orders, it is the customary practice to divide this available supply each day or week among the mines in accordance with their rating. The ratings are presumed to be determined on the basis of capacity to produce and load coal. The theory is that each mine shall, in times of car shortage, have its pro rata share of the empty cars. It has also been the practice in the past for some railroads to make arrangements with individual operators whereby mines producing coal for railroad use were given not a pro rata share of the cars available, but all the empty cars the mine could load, that is a full car supply. Such cars were taken out of the supply to be distributed in accordance with mine ratings for commercial loading and were "assigned" to specific mines for loading for specific consignees, the railroads. The only practical limitation on this practice in recent years has been the rule that a mine could not be given both "assigned" cars and "system" cars —system cars being those available for pro rata distribution for commercial loading—unless both were counted as part of the mine's distributive share.

The great majority of soft coal operators, including many who have accepted assigned cars, are opposed to the practice because of the inequalities it produces in times of good market and poor car supply, because it is a form of special privilege and because of alleged abuses. The Interstate Commerce Commission began an investigation of this subject in March, 1921, and after extended hearings, the taking of voluminous testimony, and much argument, decided on June 13, 1923, that because the practice is "unjust and unreasonable and unduly and unreasonably preferential" it shall be abandoned as of September 1, 1923. The commission included private coal cars in its findings and conclusions. The effective date has since been changed to November 1, 1923.

Coal companies, industrials, and public utilities own coal cars to the number at present of some 28,000 and use them in transporting coal from mines they own from other mines to customers if producers, or to themselves if consumers. The rule has been that private coal cars could be assigned to a mine in any number, irrespective of the state of supply of system cars, and that if on any one day the number of private cars available for a mine were less than the pro rata share of other cars given on that day to other mines, the mine receiving private cars was entitled to sufficient system cars to bring its day's quota up to the average.

The Interstate Commerce Commission in its decision of June 13, 1923, says that (after Nov. 1, 1923) private coal cars may not be assigned or otherwise used for transporting coal except as system coal cars are used; the mines owning or having the right to such private cars may not produce coal at any greater rate per day than mines depending on other coal cars. The basis for this decision appears to be that private coal cars have enjoyed and have been afforded preferred treatment by the carriers. Coal in private cars is susceptible of easier movement than coal in other cars, because it moves in large or train lots between regular points. The preferred treatment has been in the use of locomotives and road service.

Conclusions As Respects Assigned and Private Coal Cars

The regularity of operation enjoyed by soft coal mines through the continuous car supply afforded by the assigned and private cars is desirable. Cost of production is lowered; regular work is given to labor; management has the opportunity to perfect its processes; coal losses in mining are minimized; the consumer is not troubled by irregular receipts or uncertainty of fuel supply. All of these are conditions earnestly to be sought. The assigned car for railroad fuel gives it to some, but cannot give it to all and is, therefore, held to be a special privilege and has been forbidden, as it should be.

There is a difference with respect to the use of private coal cars upon an assigned basis. The beneficiary invests heavily in order to improve his service, whether it be delivery or receipt of coal. Ordinarily the enterprise that can afford an investment to lower cost or improved service is fully entitled to the benefits that flow from that investment. Private coal cars, however, are not like machinery used in the production of coal, or tramways, or even barges that a coal company might buy or build to facilitate its operation. These cars must travel over the rails and be pulled by the locomotives of a common carrier, subject to all the checks and balances regulating the public relations of that carrier.

The private coal car is an instrumentality of commerce and is subject to the regulation of the Interstate Commerce Commission. That commission has found that the assigning of private coal cars is a practice that left alone will grow and says, "The result is not only an increasing gross inequality between users of this form of equipment who are able to afford the very considerable expense in procuring and maintaining such equipment, reflected immediately in the disproportion between the amount of their output or consumption as the case may be, but also that the available facilities of the railroad carrier other than cars—locomotives, tracks, and terminals—are taken up in great degree by such classes of preferred users, so that the commercial mines are and will find themselves unable to procure transportation for even the ratable share of the cars which the carriers own and set for them."

The economic reorganization of the bituminous coal industry, the elimination of overdevelopment and intermittent operation can never be accomplished or even advanced by way of priority or preferment of transportation. The use of transportation for the distribution of coal must be free and untramelled, hedged only by such regulations as will prevent discrimination and insure equable treatment for all.

Mine Car Ratings

The importance of mine car ratings has already been discussed, and a change in the system recommended, by which the ability of the producer to sell his product rather to produce coal is made a controlling factor in coal car distribution in times of transportation shortage. The commission finds that the present system is at fault, also in respect to what are called development ratings. It has been the rule in recent years that a so-called new mine should be given a preferential car supply for development purposes of three cars per shift for two shifts per day, or six cars. Mines ordering cars on this basis have been supplied in times of car shortage before allotments were made to going commercial mines. Because of this arbitrary advantage, it has not infrequently happened that small operations that were never intended to be developed into real mines were given more cars than well-organized properties immediately adjacent of many times the capacity were allotted from the distinctive share. No sizable mine capable of efficient operation can be opened and developed in less than a year and it should be provided that such a mine be given a fair allotment, if desired during the development period, upon giving ample notice to the carrier of its prospective requirements. The rules should be amended universally so as to prevent the speculative producers from getting a preferential supply of cars in time of shortage.

Storage-in-Transit Rates on Coal

There is no point in establishing in-transit rates on soft coal for storage purposes. Bituminous coal should be stored by the consumer at the point of consumption. To break the going of the coal from mine to consumer will not add to the transportation facilities or otherwise increase the ease of transportation.

The exceptions, such as dock storage at the upper Lake ports, along the New England coast and in conjunction with river transporation do not require in-transit rates. If ever water transportation should be brought under rate regulation, then the question of in-transit rates on storage coal would become a matter for consideration.

Coking-in-Transit Rates

Consideration should be given by the railroads to the establishment of coking-in-transit rates. Coal is coked at the mines in beehive ovens, a wasteful process, now giving way to coking in by-product ovens that save the gas, tar, ammonia, benzol and other products. The by-product coking industry has developed rapidly in the past ten years without having coking-in-transit rates and the railroads in their statements to this commission point to that record as evidence that such rates are not essential to the further development of the by-product coke industry. In this way they are unmindful of the fact that the growth thus far has been in connection with the iron and steel industry. The ovens for steel companies are built at the point of consumption of the coke and there has been no question of rates for transportation of the coke beyond.

There is, however, a large and growing field for the growth of this industry in the direction of supplying gas and coke for municipal and household use. This requires that the ovens be located at or near the larger cities. A few such plants have been built. The gas is piped to the consumers, but the coke must be transported by rail. The coal must be carried to the ovens by rail. There is now no relationship between the two rates. The coke from such ovens must compete with beehive coke shipped direct from ovens at the mines, or with anthracite. The beehive coke and anthracite are carried on through rates. The coal from mines to by-product ovens and coke from these ovens to consumers are carried on two rates (the one on the coke usually a high local rate) which combined, are much higher than a through rate would be.

A coking-in-transit rate would be a competitive through rate by which the coal would be carried from mines to ovens and after conversion to coke, transported beyond to the consumer. Such rates will advance the by-product coking industry and the conservation of natural resources.

Reconsignment and Diversion

Reconsignment, for a long time accepted as a legitimate and proper transportation service and a commendable aid to the promotion of business, in recent years has been a source of acute con-

troversy. Those favoring the elimination or radical curtailment of the practice have denounced reconsignment as the stock in trade of the coal speculator and the foe of transportation efficiency. The defenders of reconsignment have been equally vigorous in asserting that the practice was a public necessity and a means of reducing car detention and railroad delays.

Whatever the form the reconsignment may take, the service involves what is known as "the protection of the through rate." This means that the receiver pays not the through rate to the first billed destination plus the local rate from that destination to the final destination, but the through rate (if published) from the point of origin to the ultimate destination. In the early days the service of reconsignment itself was performed without charge, but in late years it has become the general practice to make a separate charge per car for reconsigning. One charge is made if the reconsigning order is in the hands of the carrier in time to effect the service prior to the arrival of the car at the first billed destination and another and materially higher charge if the order reaches the carrier after the arrival of the car at first billed destination.

The argument in favor of reconsignment rests upon two major premises, viz.: (1) Irregularity in transportation service, and (2) irregularity in commercial demand for fuel. There is a third reason why the wholesale branch of the industry favors the reconsignment practice; it permits the wholesaler to conceal the identity of his customers from his shipper. In times of fierce competition for business, this is an advantage of considerable value to the wholesaler who knows that some of his sources of supply are not above "stealing" customers and is more or less suspicious of other operators. The right to use the reconsignment service to conceal the name of the ultimate consignee from the original consignor has been specifically upheld by the Interstate Commerce Commission.

The major arguments against the reconsignment practice are that it delays railroad equipment and encourages speculative trading in coal. The first argument is based upon transportation grounds, the second on commercial. Theoretically these objections may be sound, actually they rest upon a modicum of fact. Because the car service (demurrage) rules of the railroads allow 24 hours free time on cars held for reconsignment, many critics unfamiliar with actual railroad and coal trade practices have assumed that cars under load have been held by consignees for days and weeks until such times as coal prices have reached levels high enough to satisfy the cupidity of the coal speculator. And this myth is given a new lease on life every time an enterprising newspaper photographer takes a picture of a railroad hold yard.

That consignment facilitates, rather than retards, transportation has been frequently recognized by the Interstate Commerce Commission. While the decision in *The Reconsignment Case* (*I. & S. Docket* 1050) approved the tariffs, increasing charges and curtailing the extent of the privilege, it did not deny the advantages that accrued. Moreover the transportation conditions prevailing at the time that case was heard and decided were abnormal. That it was possible to delay equipment unduly, particularly under the free-and-easy rules of days gone by when shipments might be held and reconsigned a number of times is self-evident. In recent years, however, with car service rules rigidly enforced and the reconsignment practice itself subject to sharp limitations, the extent to which the privilege can be and is abused has been grossly overestimated. Undoubtedly there have been isolated cases of abuse, with undue detention of railroad equipment, but it is significant that the most extended investigation ever made by the Interstate Commerce Commission into the question of reconsignment of coal produced a record practically barren of specific evidence of such abuse although witnesses hostile to reconsignment were repeatedly challenged to give testimony substantiating this common charge against this particular railroad service.

There remains to be considered what may be designated as the commercial "objection" to reconsignment. This objection is based upon the deep-seated belief that it is a more or less common practice of the wholesaler in times of emergency to pyramid sales, that a car of coal will pass through the hands of several middlemen before it reaches the ultimate consumer with each resale profit added on to the final cost. Those who are firmly convinced that this is the manner in which the wholesaler conducts his business are equally strong in their conviction that such methods would be impossible without the employment of the reconsignment device. What they are trying to do in their campaign against reconsignment, therefore, is to curtail or eliminate a transportation service for the purpose of regulating a commercial transaction in coal. The weakness of this method of attack lies in the fact that even the most exaggerated cases of pyramiding need not increase car detention at the large terminals.

Assume, for the purposes of illustration, that wholesaler A at Chicago sells a car of transit coal to wholesaler B, who in turn resells it to wholesaler C and that this process is repeated six or seven times until the car is finally sold by wholesaler X to an industrial consumer or a retail coal merchant. Railroads at Chicago have a rule that they will not accept a reconsigning order that does not move the freight. Therefore, when wholesaler A sells to wholesaler B, a reconsignment order is not handed to the railroad, but these transfer orders are accumulated and pass from wholesaler to wholesaler until X is ready to give final disposition on the car. X gives the reconsigning order to deliver the car to the industry or retail yard, with necessary supporting papers to establish X's right to order disposition, and there is only one transaction as far as the railroad is concerned.

Even were such resales much more common than they are—they are the exception, not the rule—their elimination depends on a question of commercial ethics and not one of railroad practice. Moreover, in many cases the explanation back of certain resales of the same car of coal is of a character to satisfy the most captious critic of business methods. After all, the real beneficiary of reconsignment is the consumer. If a certain percentage of the tonnage on wheels can not be kept liquid, the consumer will suffer when the situations outlined in the summary of the arguments in defense of the reconsignment practice arise; he will be either without coal or compelled to pay an exorbitant premium for spot tonnage.

Storage of Coal by Railroads

The steam railroads of this country consume 27 per cent of the bituminous coal produced. They are the largest single group of consumers. The policies of the carriers with respect to purchase of their fuel coal, whether they exert their huge purchasing power to bear down unduly on the price they pay, whether they play favorites in making their contracts, whether they buy seasonally or distribute their orders throughout the year and store in the off seasons, all have a large influence in the fortunes of the soft coal industry.

These policies vary with the different roads. The railroads have usually been able to secure prices more favorable than other buyers, in part because of the use of assigned cars and in part because of the sheer magnitude of their purchases. The bargains they make with the producers are matters between the two parties, but the practice that has been indulged by the purchasers of fuel coal of radical shifts in large blocks of tonnage, even to the extent of taking coal from mines at distant points, has worked unnecessary hardship on substantial groups of operators and mine workers.

It is to the interest of the railroads as well as the bituminous coal industry that there be essential stability in their contract relations. The responsibility of the railroad purchaser in encouraging overdevelopment by transferring his orders to a new field is not less than that of the operators in dealing fairly with the railroads in recognition of the essential primary need of the carrier for proper coal at reasonable price. The public is concerned to the extent that it is too often called on to make up the losses of the operators sustained in selling coal to railroads at unremunerative prices.

The question of storage of coal by railroads is closely linked with the other matters of fuel coal purchasing policy. To buy and store coal in the summer months represents a cost that the railroads would prefer to avoid. Many roads store coal only under exceptional conditions. They have depended in the past on getting their supplies currently. This is particularly true of those that have large producing fields on their lines.

Offsetting the cost of storage are the facts of better prices in the summer storage season than in the winter period of maximum requirements; the more positive assurance of supply the elimination of excuse for confiscation, and the release of cars for revenue business. The assigned car for railroad fuel has operated to relieve the carriers from their proper responsibility in regularizing the production and distribution of bituminous coal. As the largest users of coal, the railroads and public utilities have the largest moral responsibility in every measure of stabilizing the industry.

Unnecessary use of cars for holding storage coal in times of strong demand is a practice that may reduce costs for the railroad but it raises the cost to all other consumers. Storage on wheels subtracts from the people's car supply.

The Long Haul on Coal

By a gradual process, beginning half a century ago, freight rates on coal have been built up to the present complicated structure. At first those fields close by the natural location of coal consuming industry were opened or industry grew up around rich coal deposits, the coal producing and coal consuming industries developing together in a logical relationship. Later, other coal deposits of high quality were discovered, railroads built and mines opened remote from industrial markets and large centers of population. Under the pressure of demand for the development of coal traffic from these new fields over these newer railroads, freight rates were established sufficiently low to permit the distant coal to compete in large markets with other, nearer coal. The rates on these long hauls were established without adequate regard to the cost of the transportation service rendered. Thus, much of the soft

coal that is now produced and consumed in this country is transported undue distances, in many instances on its way to market passing across other fields producing coal of similar character. That these long haul coals, as those of Southern West Virginia, Eastern Kentucky and Southern Illinois are of high quality has added to the facility with which they have encroached on the natural markets of the older fields.

There is little dispute of the fact that the differentials in rates, early established and but slightly modified since, by which these remote coals are able to enter the large consuming markets, do not reflect the differences in cost of transportation. It is equally apparent that the long haul brings about a dilution of coal car equipment and other transportation facilities. Since in the aggregate the consumers must pay the total cost of all transportation, whatever actual loss or inadequate return is incurred as a result of these long hauls on coal is paid for in the rates on other coal or other commodities.

During the war, artificial zoning of coal shipments was adopted having as a double purpose the saving of transportation and the control of distribution. Such arbitrary restriction of markets can only be justified by such an emergency. There is adequate opportunity, however, for the proper control of distribution and the maintenance of natural limits on the markets in which the coal from each field may successfully compete for its share of the going trade, through freight rates.

The inevitable result of an overdeveloped soft coal industry is that each field is seeking to widen the territory in which it can market its product. If the cost of production cannot be lowered, the effort is to have the freight rate reduced relative to the rates from other competing fields. It is against this tendency that the country must set its face. The conditions that have grown up through half a century cannot, however, be reversed in a day. The investment in railroads and coal mines fostered by a policy of making rates that permit competition without regard to the compensation to the carrier in the rates, cannot be set at naught in any sudden manner.

On the contrary, gradually and without undue violence to established conditions, the rates should be readjusted to re-establish more natural relations between the elements of cost and service. The result will be a reduction in the total cost of transportation to the nation. This proposal is apparently in line with recent decisions of the Interstate Commerce Commission.

There are three important water routes by which coal is transported; from Eastern fields over the Great Lakes to the Northwest; from Southern fields coastwise to New England, and from Southern fields over the Ohio river and tributaries to Middle Western markets. Of these, the Lake and coastwise trades have been highly and efficiently developed. They are important parts of the general distribution system for coal. Millions of tons of coal are afforded transportation on the Monongahela, Allegheny, Ohio, Kanawha, Warrior and other rivers. Practically all the anthracite and bituminous coal reaching New York City is carried by water on the last stage of its journey.

The use of the Ohio river has not progressed and is not developed as the aid to rail transportation that it is capable of and should be. The reason is not far to seek. The rail carriers taking coal from Virginia and West Virginia mines to tidewater for movement coastwise to New England are not competitive with those in New England that deliver the coal inland and are competitive with the carriers that make all rail delivery from mines in Pennsylvania to the same markets. The railroads that take coal from the Eastern fields to Lower Lake Erie ports for trans-shipment on the Great Lakes are not competitive with those roads delivering the coal from the head of the lakes and are competitive with those hauling the competing coals from Illinois and Indiana.

The situation on the Ohio river is quite different. Here the water route is in direct competition with the railroad that both orginates and delivers the coal; the two are parallel routes. At one time there was a substantial movement of coal from West Virginia mines down the Kanawha and Ohio rivers to Cincinnati and thence by rail to points beyond. This movement has been discouraged, if not stifled, by the railrates in effect on ex-river coal to points beyond Cincinnati. The long-continued policy of waterway improvements financed by the national Government has been ineffective in operation through unfair competition on the part of the railroads, which can now be directly controlled in accordance with the policy, expressed in the Transportation Act, "to promote, encourage, and develop water transportation service and facilities in connection with the commerce of the United States."

Greater use of this river transportation under the powers granted to the Interstate Commerce Commission, would add to the transportation facilities of the railroads carrying the coal from Eastern Kentucky and Southern West Virginia, for a short rail haul or no rail haul from the mines to the river tipples and a long haul by barge on the water would replace a long rail haul, with the ultimate advantage of getting more coal to market with less coal cars.

Ticket Agents Hold Convention at Portland, Ore.

THE FIFTH ANNUAL CONVENTION of the American Association of Railroad Ticket Agents was held at Portland, Ore., September 13 to 15, with approximately 800 in attendance. The principal addresses were made by Ralph Budd, president of the Great Northern, and S. J. Burton, president of the American Association of Railroad Ticket Agents.

Mr. Budd spoke on the public benefits which will follow the granting of more freedom to the carriers. He said in part: "We are confronted by two surprising facts of great importance. One of these is that it is represented to the railroad employees that they are being paid lower wages under private management than were paid under government management, when the fact is that they are being paid higher wages. The other is that representations are being made to the public that it is paying more for railroad transportation than it did or would under government operation, when, in fact, it is paying less for it than it did during the closing months of government operation. The question naturally will be raised as to how it is possible for the railroads to pay a higher average wage than they did under government operation and at the same time charge the public relatively less for its transportation service. The answer is that railroads are being more economically operated and that the net return upon the value of the railroad properties being used for transportation purposes is inadequate. In other words, private operation is now being carried on to the very great advantage of the public and the employees, but at a considerable sacrifice to the owners."

Mr. Burton discussed the growing competition of truck and bus lines with the railroads and asked for a fair consideration of rail problems on the part of the public. He said in part: "The local business of many railroads where they are paralleled by bus lines is gone since the frequency of service and the cheapness of the fare is such that the railroads cannot compete. In addition to this, state public utility commissions have forced the railroads to maintain a local or branch line service which does not pay. The only remedy which we can think of is to insist that the bus lines as common carriers and using the property of the state in their business, be required to pay a tax in amount to commensurate with the use which they make of the public highways."

Among papers read were "Lessons from Our 1922 Convention," by F. J. Eddy, ticket agent at the Grand Central Station, Chicago; "The Educational Value of Our Annual Conventions and How to Profit by Them," by N. L. Bassett, general ticket agent at the Union Station, Indianapolis, Ind.; "The Education of the Ticket Agent," by J. A. Ormandy, general passenger agent of the Southern Pacific, and "Pullman Service," by H. P. Clements, general passenger agent of the Pullman Company, Chicago.

On returning from San Diego, Cal., 250 members of the association accepted the invitation of the Chicago, Rock Island & Pacific to travel over that road to Chicago and were given meals composed of food raised in the states through which the special train passed. The first dinner on September 20 was composed of California products; breakfast the next morning was composed of Arizona foodstuffs; Texas supplied the lunch, New Mexico the dinner and Oklahoma the breakfast the following morning. Kansas furnished the luncheon and Missouri furnished the dinner on September 22, while on the following morning Illinois products composed the breakfast.

THE WHEAT CROP of Alberta, this year, according to the estimates of the Provincial Department of Agriculture, will amount to 142,955,000 bushels.

Waco, Tex., Celebrates Opening of Katy Shops

A Very Unusual Demonstration Recalling Past Years When the Public Welcomed Railroad Development

THE OPENING of the new shops of the Missouri-Kansas-Texas Lines at Waco, Tex., was celebrated at that place on September 13. What was done was so unusual in its character and significance that the celebration is worth describing in some detail. In the early days of railroad development many communities celebrated the construction of new railway lines into their territory. They continued to do so until the construction of new railway lines almost came to a stop about 15 years ago. Since then spokesmen of the railways have been trying to impress on the popular mind that increase and improvement of the facilities of the railways are still just as necessary and important as they ever were. The people of most parts of the country have accepted this doctrine unwillingly or refused to accept it at all.

The people of Waco showed in a very unusual and striking manner their appreciation of the benefits to be derived by themselves and the other people of their part of Texas from the construction of the Katy's new shops. These shops already have been described in the *Railway Age,* June 16, 1923. They are of the most modern design, construction and equipment and will be used to repair and maintain a large part of the locomotives of the Katy lines. They largely replace the locomotive shop at Denison, Tex., where the facilities for repairing cars are being enlarged.

The Kiwanis Club of Waco decided that since these new shops would immediately become the largest single industry of their city, their opening would afford a fitting occasion for a big celebration and a get-together meeting of the citizens of Waco and the officers of the railroad.

The invitation to attend the celebration was accepted by a large number of the officers of the road. Among these were C. N. Whitehead, executive vice-president; W. M. Whitenton, vice-president in charge of operation; C. Haile, vice-president in charge of traffic; H. E. McGee, general manager; Frank Johnson, general treasurer; W. G. Crush, passenger traffic manager; W. E. Williams, director department of personnel; Z. G. Hopkins, director bureau of public relations; F. K. Tutt, mechanical superintendent; Frank Ringer, chief engineer; M. C. M. Hatch, mechanical engineer; M. D. Chase, shop superintendent; H. H. Johntz, engineer maintenance of way. The officers of the road were accompanied by W. Frank Carter, St. Louis, a director of the road, and H. E. Kiel, now mayor, and F. H. Kriesman, former mayor of St. Louis. Among those who took a prominent part in arranging and carrying out the celebration was Albert T. Clifton, a prominent business man of Waco who also is a director of the railroad.

The results showed it may be as easy to arouse the interest and enthusiasm of the people of a community with regard to the construction or enlargement of the facilities of an existing railway as it was in the past to arouse their interest and enthusiasm with respect to the construction of a new railroad line into their community. They also showed that if railway officers take advantage of the opportunity to mingle and fraternize with the people of communities they serve, the public will manifest just as much friendliness toward the railroad as toward any other kind of enterprise. The celebration helps to illustrate a point the *Railway Age* has repeatedly made in editorials—viz., that the main reason why so many railways have not enough friends is that they have not really tried to make friends.

The festivities began early in the morning when a large party of citizens met the visitors at the railway station. A parade was formed which was led by a band composed of employees of the Parsons shops of the Katy and an imitation locomotive which had been specially built upon the chassis of an automobile truck and which was driven by Mr. Whitehead. There followed a long procession of automobiles. The townspeople turned out to see the procession as numerously and enthusiastically as they would appear on hand to see a circus parade.

At noon a luncheon was given by the Kiwanis Club which was attended by a big crowd and at which the Katy's new shops and its visiting officers were given an address of welcome by the mayor of Waco, Ben C. Richards. Mayor Kiel and former Mayor Kriesman of St. Louis also made speeches.

Townspeople Turn Out to See Shops

In the afternoon the Katy ran several special trains from the city out to the shops which the public was invited to visit. The entire business of the town was suspended and the shops were crowded all afternoon by visitors of both sexes and all ages. The shops were in full operation and the 180-ton crane carrying an entire locomotive back and forth overhead proved to be a spectacle fully as interesting to the visitors as the parachute leap by a Katy freight conductor from an aeroplane which was one of the features of the entertainment.

The celebration was concluded in the evening by a banquet given in the Texas Cotton Palace and attended by about 1,300 people. The speakers included Vice-President Whitehead, Congressman Tom Connally, W. F. Carter, a director of the road from St. Louis; Samuel O. Dunn, editor of the *Railway Age;* Doctor S. P. Brooks, president of Baylor University, and W. V. Crawford, president of the Texas Cotton Palace Association.

Whitehead Reviews Katy's History

Mr. Whitehead, in his address, gave some interesting historical facts regarding the M-K-T Lines.

"The M-K-T is a distinctive railroad," he said. "It is a pioneer railroad. It ran the first train into Texas from the north. Among its original promoters were some of the financial giants of their time and financiers who were just beginning their spectacular careers, such as Russell Sage, Jay Gould, Levi Parsons, Henry K. Enos, John D. Rockefeller and J. Pierpont Morgan. Forty years ago its general passenger agent, who is still living in Cleveland, Ohio, arranged the longest sleeping car line in America, over the Burlington from Chicago to Hannibal, and M-K-T from Hannibal to Denison, and H. & T. C. from Denison to Houston.

"The M-K-T was chartered in Kansas 58 years ago in September, as the Union Pacific Railway Company, southern branch, and in 1870 changed its name to Missouri, Kansas & Texas Railroad Company. It is interesting to recall that the charter of the original Union Pacific Railway Company, southern branch, provided for the construction of a railway commencing at or near Fort Riley on the line of the Union Pacific Railway, running thence to a point at or near where the southern boundary of the state of Kansas crosses the Neosho river, the ultimate object being to insure the construction of a continuous line of railway from Fort Riley via the Arkansas and Red rivers to New Orleans, La.

"In six years the company had completed its lines from

Junction City through Parsons to Chetopa, Kan., and from Hannibal, Mo., through Sedalia to Parsons, Kan.

"Just after the close of the Civil War the government of the United States wanted railroads, not only for developing its resources but for military purposes, and it particularly wanted a railroad from the north to the Texas border and through Texas to the Mexican border, and Congress passed an act granting every alternate section of land for 10 miles on each side of the right-of-way, and a 200-ft. right-of-way through the Indian Territory to the first railway company which should complete its lines from the southern boundary of Kansas to the northern boundary of Texas.

"Three railroads started in the race, two finished, the Santa Fe and the M-K-T, and the M-K-T won, reaching the Red river and Denison with its rails in 1873. This race was one of the greatest romances in railroad history—it was an epic.

"The superhuman effort made by the builders of the two lines to win the race, the difficulties they met and overcame, the trickery each resorted to in the effort to impede and delay the others, and the final result furnish one of the heroic chapters in the history of our country and its railroads. President Grant certified the M-K-T as winner. The promoters of the M-K-T and their successors were denied by Congress and courts their reward of the land grant which they so signally won, and which today is of incalculable value, but they were not disappointed in their predictions of the richness of Texas and the wonderful development to take place there."

After having reviewed the railway's "construction" period he reviewed its period of reconstruction, which began when C. E. Schaff became president in 1912. From 1892 to 1913 the railroad spent 12 million dollars for improvements in Texas.

From 1913 to 1923 the railroad has expended in Texas for improvements $17,385,000. A drastic financial reorganization, he said, has put the railroad in a position secure from fear of future financial disaster, and the improvement of its physical property and its organization has made it capable of rendering superior service and handling a much larger business than it now has.

"What is the Real Railroad Problem?"

Mr. Dunn discussed the question, "What Is the Real Railroad Problem?" He said, "The occasion being celebrated afforded a good starting point in answering this question. The new shops already had caused investment of a large amount of capital in Waco and by giving employment to a large number of men would substantially increase the population, business and prosperity of the city.

"Their erection and operation," he said, "will, however, have a much broader significance. They will increase the total amount of railroad service that can be rendered in the territory. It is necessary for the railways to increase their capacity because, under normal conditions, the demands made upon them by traffic increase about 50 per cent in every 10 years. To handle this increased business they must increase the number and capacity of their locomotives and cars. This makes it necessary to enlarge old and build new shops, but it would be useless to increase the amount and capacity of the equipment if the railways did not at the same time increase the trackage upon which locomotives, cars and trains must be run and enlarge the capacity of the yards and terminals in which trains must be made up and broken up.

"To increase all these facilities of the railways requires the constant raising and investment of capital. The real railroad problem from the standpoint of both the public and railway owners and managers is that of getting enough capital invested in the railroads to enable them to increase their facilities as fast as the growth of the traffic which must be handled.

"Congress recognized this fact in framing the Transportation Act and tried to so frame it as to cause a revival of the development of the railways, which had greatly declined before the war. The success of radical legislation now being advocated to repeal the Transportation Act and arbitrarily reduce the valuation placed upon the railways by the Interstate Commerce Commission would absolutely stop such increase in the facilities of the railways as the people of Waco are celebrating.

"The railways of western territory as a whole are still making such poor earnings that many of them are in danger of bankruptcy, and until their net earnings improve a large majority of them will be unable to extend their lines or make other improvements necessary to continue the development of this territory, a large part of the resources of which are still untouched and never can be developed without further development of their means of railroad transportation.

"It does not seem to be generally understood that the western lines are not participating in the improved financial results being shown by railways in other parts of the country. The average return earned by the western roads on their valuation in 1921 was 3.57 per cent and in 1922 it was 4 per cent. In the first six months of 1923 they earned only 4.2 per cent upon their valuation. There are 77 Class I railways in this territory and of these 37, which operate over 41,000 miles of line, or about one-third of the entire mileage in the territory, have not in the last 2½ years earned enough net income even to pay the interest on their bonds. Some of these roads already have gone bunkrupt and it is obvious that in a comparatively short time others will go bankrupt unless their net income improves. There are numerous other roads in the territory which have been barely earning the interest on their bonds but have not been able to pay any dividends. There are still others that have not been earning enough to pay dividends but have been paying them from surplus and will have to quit paying them if their earnings do not improve.

"The people of western territory need prosperous railways. This territory could not have increased its population, its production and its wealth as it has in the past except for the development of its railways and it cannot continue to increase them in future without corresponding development of its railways. The development of its railroads cannot continue unless the net return earned by them is increased, and, yet although the western railways, because of conditions that have been mentioned, are still making such poor earnings, there is more agitation in western territory than in any other part of the country in favor of reductions of rates and a radical policy of regulation which would not only immediately bankrupt a large part of the western lines but stop their development as long as this radical policy was continued."

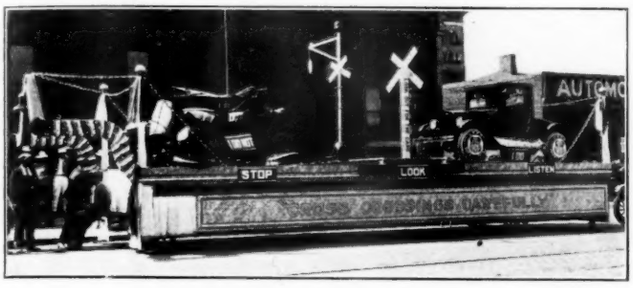
Advice to Railways from a College President

President Brooks of Baylor University emphasized the difference between what railway officers had been doing in Waco that day and what they had done in former years. He recalled a time when railway officers sought to control legislation by illegitimate means and so held aloof from the public that the public became suspicious of them and antagonistic to the railroads. The attendance of the Waco celebration by a large part of the officials of the Missouri-Kansas-Texas Lines and the part they had taken in the celebration, he said, had made those who came in contact with them realize they were able, hard working, human men who are really trying to serve the public. He earnestly advised the officers of all railroads to mingle more with the people of the communities on their lines, not merely when the railways are seeking something from the public, but also when they are not seeking anything or are plainly trying to do things for the public.

Union Pacific Safety Rally Promotes Good Will

Omaha Meeting Helps Establish Cordial and Friendly Relationships with Public and Employees

ONE OF THE LARGEST safety rallies ever held on the Union Pacific was staged at Omaha, Neb., on September 15, 1923, in which over 10,000 people participated. The activities of the day started at 8 a. m., with the arrival of special trains from different points on the Union Pacific, and extended throughout the day until midnight. The "Safety Rally Day" was the first big feature of the Ak-sar-ben fall festival which is held annually in Omaha. The features of the rally were a parade of Union Pacific employees and officers from every department of the railroad in the afternoon, followed by a barbecue at Elmwood Park.



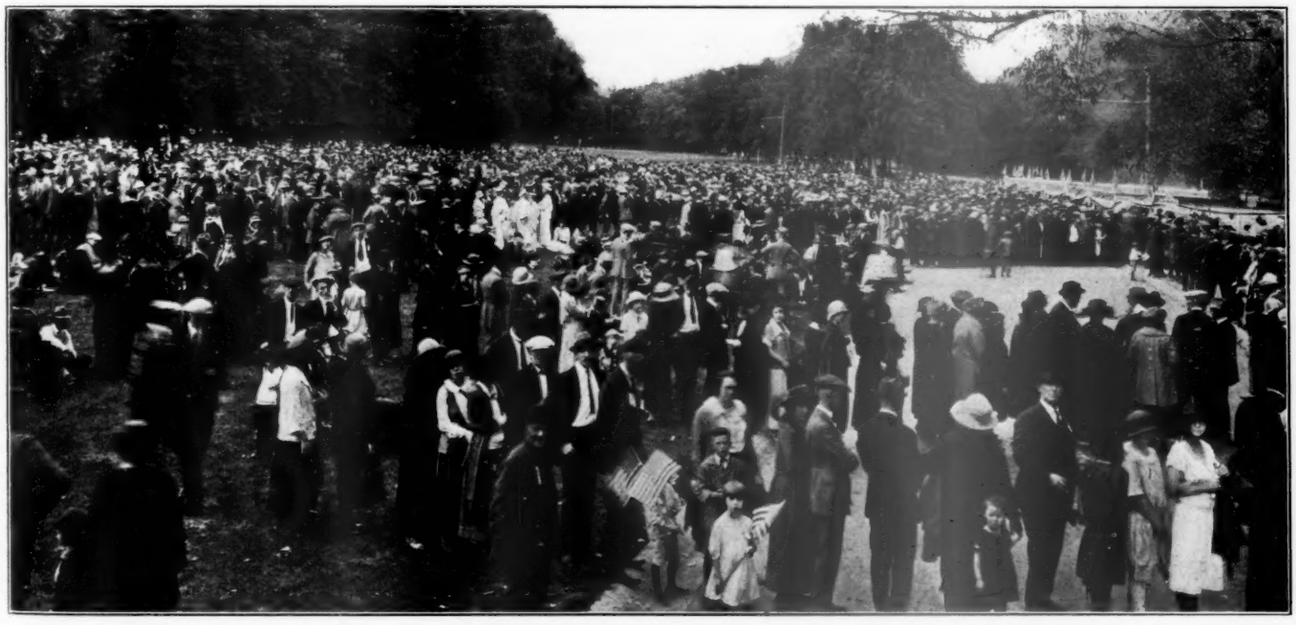
Cross Crossings Cautiously

A program of speaking and music at the auditorium in the evening ended the day's activities.

In an address at the Auditorium C. R. Gray, president of the Union Pacific, emphasized the importance of the human relationships in railway work. He expressed the desire that the vast army of employees in the Union Pacific organization should know each other and should emphasize more of the social feature in their dealings with each other because most of the difficulties in this world are only great because they are distant. Permanent satisfactory relations are promoted by the opportunities which the employees have to establish closer relationships and a stronger spirit of friendship with each other.

Others who gave short addresses at the evening's festivities included W. F. Gurley, attorney, of Omaha; C. E. Howard, president of the Commonwealth Steel Company, St. Louis, Mo.; J. L. Kennedy, president of the United States National Bank of Omaha and J. C. Dahlman, mayor of Omaha. This program was followed by a show given by the Ak-sar-ben.

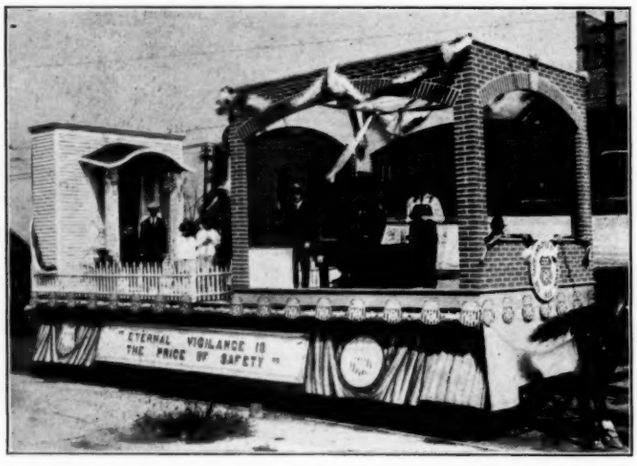
The parade which started at 2 p. m., was approximately two miles long, requiring an hour in passing the reviewing stand. It consisted of eleven divisions, the first made up of city officials of Omaha and police and the Seventeenth Infantry and band and the second of the general officers and guests and general office employees. The other divisions consisted of officers and employees from all departments and from different points on the road. About 3,500 employees were present from points outside of the Omaha district in addition to about 5,000 employees from Omaha, South Omaha and Council Bluffs. About 200 pensioners in automobiles made up one division of the parade while the last division consisted of selected units from the Omaha fire department. There were 12 bands from different points on the railroad and a number of floats in the parade. A number of special trains brought employees from remote points including 16 cars from Cheyenne, Wyo., 14 from Kansas City, Mo., 13 from North Platte, Neb., and five from Denver, Col., while a number of regular trains were operated in several sections.



The Barbecue at Elmwood Park

Three floats in the parade conveyed messages which the Union Pacific wished to emphasize in its safety first work. One float "Goggle Safety," at one end, showed part of a machine shop in operation, equipped with modern safety ap-

pliances and at the other end the doorway of an employee's cottage with the father returning to his family safe and sound. Emphasizing the danger at highway grade crossings was a float entitled "Cross Crossings Cautiously," which showed the result of an automobile accident where the driver failed to heed the warning to "Stop, Look and Listen." The first "Overland Limited" was represented by a mounted Indian chief and his squaw dragging behind them a litter on which were perched two papooses. A miniature train in the parade



The Goggle Safety Float

depicted the modern method of shipping material with a locomotive built around a tractor and miniature cars, including four box cars, two refrigerator cars, one stock car with a live pig inside, two gondolas loaded with coal, a flat car with lumber, an oil tank car and a caboose.

The hospital corps and the Union Pacific girls also had floats, the Wyoming division contingent being headed by cowgirls. One of the floats in the parade represented an early section gang, showing the old time hand-car, the men and the armed guards. There was a locomotive exhibit on the Union Pacific tracks during the day, showing the types of locomotives used today as compared with those in the early '80's.

Among the results of safety rallies of this character is the greater realization by the public of what a railroad means to a community. The public had brought home to it graphically what the safety movement means as applied to itself with respect to highway grade crossings, while the employees got a better conception of what it really stands for.

The safety rally was planned and carried out under the general direction of H. A. Adams, assistant to the general manager in charge of safety matters, and the Omaha Chamber of Commerce, the Ak-sar-ben organization and city and county officials co-operating.

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER of cars loaded with revenue freight during the week ended September 8 showed a decrease as compared with the record-breaking figures of the previous week because of the Labor Day holiday. The total was 928,858 cars, but this represents an increase of 105,611 cars as compared with the corresponding week of last year and of 179,306 cars as compared with the corresponding week of 1921; on the basis of a five-day week the loading was approximately 185,000 cars a day as compared with an average of 182,000 cars a day during the preceding week.

In addition to the effect of the holiday, there was probably some decrease in loading due to the suspension of work in the anthracite coal fields. Reductions as compared with the preceding week were shown in all classes of commodities, but increases as compared with the loading for the corresponding weeks of the two previous years were shown in all classes except grain and grain products, which showed a decrease of 531 cars as compared with last year and of 8,182 cars as compared with 1921. The largest increases as compared with last year were in miscellaneous, l.c.l., merchandise, and ore.

The number of surplus freight cars showed a slight increase during the period September 1 to 7, when the average was 67,651 cars, including 45,245 box cars and 13,501 coal cars. For the same week the average shortage was 10,211 cars, including 2,871 box cars and 5,595 coal cars.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, SEPTEMBER 8, 1923

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L. C. L.	Miscellaneous	Total revenue freight loaded	Corresponding period	
										1923	1922	1921
Eastern	1923	7,331	3,110	30,149	3,790	5,104	7,375	57,502	84,436	198,797	.....	.....
	1922	7,062	2,523	30,055	1,321	5,422	6,095	56,060	84,061	.....	192,539	178,847
Allegheny	1923	2,818	2,788	42,455	6,524	3,246	12,238	45,951	80,738	196,758	.....	.....
	1922	2,983	2,802	44,359	4,487	2,916	8,698	44,528	73,192	.....	183,965	146,332
Pocahontas	1923	294	298	26,472	549	1,942	220	6,166	4,511	40,452	.....	.....
	1922	175	330	16,904	139	1,003	29	4,181	2,361	.....	25,122	27,228
Southern	1923	3,549	2,079	23,775	1,046	22,579	1,732	35,843	35,199	125,802	.....	.....
	1922	3,411	2,593	19,119	859	16,210	869	32,033	32,724	.....	107,818	106,276
Northwestern	1923	16,182	9,432	7,960	1,216	15,763	46,973	27,379	34,820	159,725	.....	.....
	1922	17,004	7,519	6,262	1,003	13,271	35,654	24,667	28,328	.....	133,708	117,368
Central Western	1923	12,321	14,142	16,933	281	10,212	2,775	31,194	56,812	144,670	.....	.....
	1922	13,086	11,285	15,794	436	8,035	2,219	29,578	50,554	.....	130,987	116,233
Southwestern	1923	4,287	3,867	5,252	137	7,410	381	13,635	27,685	62,654	.....	.....
	1922	3,592	2,446	6,714	133	4,599	373	11,648	19,603	.....	49,108	57,268
Total, West. dist.	1923	32,790	27,441	30,145	1,634	33,385	50,129	72,208	119,317	367,049	.....	.....
	1922	33,682	21,250	28,770	1,572	25,905	38,246	65,893	98,485	.....	313,803	290,869
Total, all roads	1923	46,782	35,716	152,996	13,543	66,256	71,694	217,670	324,201	928,858	.....	.....
	1922	47,313	29,498	139,207	8,378	51,456	53,937	202,635	290,823	.....	823,247	.....
	1921	54,964	24,700	142,148	4,632	41,796	27,619	201,147	252,546	.....	.....	749,552
Increase compared	1922	.....	6,218	13,789	5,165	14,800	17,757	15,035	33,378	105,611	.....	.....
Decrease compared	1922	531	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1921	.....	11,016	10,848	8,911	24,460	44,075	16,523	71,655	179,306	.....	.....
Decrease compared	1921	8,182	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
September 8	1923	46,782	35,716	152,996	13,543	66,256	71,694	217,670	324,201	928,858	823,247	749,552
September 1	1923	54,604	39,201	206,610	13,970	77,279	78,193	246,984	375,726	1,092,567	923,806	831,288
August 25	1923	54,950	36,413	203,076	13,513	77,957	77,918	244,265	361,840	1,069,932	879,902	828,883
August 18	1923	52,521	33,150	189,073	13,587	77,299	80,759	241,238	348,114	1,035,741	846,266	815,147
August 11	1923	46,149	30,807	177,259	12,934	73,438	81,829	227,685	323,061	973,162	842,690	808,269

Compiled by the Car Service Division, American Railway Association.

Closing Sessions of Traveling Engineers' Meeting

Interest in the Last Two Days Centered on Locomotive Feed Water Heaters and U. C. Brake Equipment

FOLLOWING THE PRESENTATION and discussion of a report on automatic train control the Traveling Engineers' Association, in convention at Chicago as reported in last week's *Railway Age*, took up the consideration of locomotive feed water heaters. This was one of the subjects, which, together with the report on U. C. brake equipment, seemed of most interest to the members during the last two days of the convention and brought forth animated discussion.

Locomotive Feed Water Heaters

Feed water heaters utilizing exhaust steam from the cylinders offer the most attractive possibilities toward the further improvement in the efficiency of the steam locomotive of any of the devices now under consideration. While this subject has only been actively considered by the various mechanical associations for the past few years, it is far from a recent development even on a locomotive. Feed water heaters of various kinds were incorporated in some of the first locomotives to be used in this country. The soundness of the principle on which they are based was recognized by the pioneer builders, as well as those of today. However, because of the increased price of coal, their value today is many times greater than it was then and it is chiefly for this reason that they are now coming into general use.

Upon investigation we find that there are three principal types of feed water heaters in general use, in which exhaust steam is used for heating boiler feed water. These are the open and closed type heater, and what is known as the exhaust steam injector.

The application of a feed water heater to a locomotive results in three principal advantages. First, it reduces the amount of coal required to produce the required amount of power; second, it increases the available water supply and, third, it reduces the amount of back pressure on the pistons, making the locomotive easier in action and more powerful. These are all very real and practical gains which all traveling engineers can fully endorse and when coal costs from $40 up to possibly $125 for each tender load, a saving of about 15 per cent represents a very substantial amount of money.

In addition to the saving in the cost of the coal consumed, there is also the reduction in the quantity of company coal to be hauled and handled, which in severe weather or periods of heavy traffic, is an item of importance. Occasionally it happens, especially on very heavy passenger power, that the gain in quantity of water available is of equal or greater value than the reduction in fuel consumption. A feed water heater by condensing exhaust steam and returning it to the tender, saves about 1,500 gal. in 10,000 gal., without increasing its size or weight. It sometimes costs a surprising amount of money to make an unnecessary stop with a heavy train and the advantage offered by the heater in this direction is not to be overlooked.

These three chief advantages of a feed water heater on a locomotive are no longer a subject for debate or discussion. There are now well over a thousand feed water heaters in service in this country, and many road or service tests made under all possible conditions have proved them beyond question.

Many, or possibly most of you, have had personal experience with heaters and have made experiments of your own. If these trials were fair to yourself and the device, they have convinced you of these facts.

In all tests of a feed water heater it should be remembered that it is chiefly a boiler appliance. The real comparison to show its effect is that of the amount of water evaporated for each pound of coal burned. This comparison will, of course, cover a period of time, be carried through the cycle and appear truly in the amount of coal consumed per thousand gross ton-miles. However, you all realize the rather wide variation that always exists in the amount of steam used to haul the same tonnage on any individual trips, because of variable operating conditions, weather, etc.; also the great difference in the train resistance of the same tonnage, and you must recognize that the coal consumption on a ton-mile basis will vary through quite wide limits without any alteration to the locomotive equipment. Therefore, do not reach an inaccurate conclusion of the effect of a feed water heater by counting the scoops of coal on a trip or so, unless you are positive that all conditions are truly comparative. It is far safer to arrange for a measurement of the water used and base your conclusions on the ratio of water to coal. While, of course, even this comparison does not include the effect of the reduced back pressure mentioned above, nevertheless it will be sufficiently close for all practical purposes. If the exact facts are required, a dynamometer test will be necessary.

Boiler Checks

When a pump is used to feed a boiler, the check valve will come to its seat at each stroke of the pump, unless a very large air chamber is used. Because of the size and weight restrictions, high speed pumps are used on locomotive feed water heaters, and there has been some trouble reported when the same boiler check was used as with an injector. This trouble was chiefly due to the small size and high lift of the check, which allowed a very hard hammer against the seat at each pump stroke, which has resulted in the valves leaking and broken valves were often found. An enlargement of the size of the valve permitting a very small lift has eliminated this trouble to a large extent. It has been found entirely satisfactory to employ lifts of ⅛ to 3/16 in. on valves 2½ in. in diameter. While these valves seat at each stroke of the pump, the low lift prevents damage to the seat or valve.

Experiments are under way with a number of specially designed check valves, with the idea of still further improving the situation. Understand spring check valves are now being used with good results but as these have only been in service a short time cannot say as to their durability.

Effect of Bad Water

Waters containing sufficient impurities to require frequent washing of the locomotive boiler, will also affect the feed water heaters. In the case of the closed type heater, deposits from bad waters are found in the heater, principally in the tubes of the third and fourth passes. The deposit on the heater tubes is far less than on the boiler tubes, and is easily removed in less time than it requires to wash the boiler. In the open type heaters the scale is found throughout the

heater, and if allowed to accumulate will affect its proper action.

In the closed heater the scale is removed by a weak solution of muriatic acid (four parts water to one part acid) rapidly circulated through the tubes by a small pump. This is followed by a circulation of water to remove all traces of the acid. Use of the acid solution has not been found injurious to the heaters.

The cleaning operation is required about every second or third boiler wash for the best results. If allowed to run longer than this, it will have no effect on the operation of the equipment, but the efficiency will be seriously decreased. The washing solution can be used over again a number of times, and only requires the addition of the amount wasted. The cleaning operation seldom requires over 30 min. and often 15 min. is sufficient.

Cleaning is not required so often on the open type heater. In this case the scale is dissolved by full strength acid allowed to stand for sometime, or the parts are removed and cleaned by acid or scraping.

Effect on Superheat

When a feed water heater is applied to an existing locomotive, it brings about a condition where there is about 15 per cent less hot gas passing over the superheater units while there is no reduction in the amount of steam passing through them. This results in a somewhat lower temperature to the steam leaving the superheater. Trials covering a wide range of conditions show that the drop in superheat averages about 25 degrees. This means that somewhat less than 2 per cent more steam will be required for a unit of power in the cylinders. However, as shown above, the decrease in amount of steam per unit of power caused by the reduced back pressure, is from 3 per cent to over 6 per cent, which more than counterbalances the loss from drop in superheat. Of course, it is easily possible to offset this drop in superheat. On new engines this is generally arranged and the full gain from reduced back pressure is obtained.

Service

No matter how successful a device may be in theory or on test, it will very quickly lose a part of its value if it requires undue attention at the terminals or makes it necessary to delay a locomotive either at terminals or on the road. It is on this rock that many apparently valuable devices have been wrecked.

Feed water heaters have been in service under our conditions for over six years in a few cases, and in considerable numbers for over two years. It is possible now to determine with some accuracy what can be expected from these designs as regards reliability, durability and cost of maintenance.

As regards reliability, the three types of heaters are giving a very satisfactory performance. The failures of the closed type of heater in service on which we have received information have been due to the breakage of some part or to the clogging of the tank hose strainer. In some of the earlier designs trouble was also caused by leakage at the tube joints, pipe joints leaking caused by vibration, broken piston rods, etc. In the open type heater some trouble has been encountered in starting, due to the sticking of the main steam valves of the pump, and also in getting the pump to handle the hot water when there is not a sufficient back pressure available to force it into the pump cylinder. There have also been some cases reported where, due to failure of the internal float to operate properly, the heater was filled with water, which passed the check valve provided in the exhaust steam pipes and entered the cylinders.

All of these failures, however, have been the exception and have been largely overcome by the manufacturers. The exhaust steam injector has not yet been in service in this country a sufficient length of time to determine definitely what may be expected in the way of maintenance. However, five of them have been in operation on one road for about one and a half years and the only thing that has developed is a slight wearing of the tubes, which is common with all injectors, and the necessity for frequent cleaning of the check valve in the oil separator. The injector tubes are easily removed and the work of applying new tubes is not any more difficult than with live steam injectors. As these equipments now stand, there need be no hesitation in applying them on the basis of reliability.

Practically the same situation exists as regards durability. Such parts as have shown weakness or unusual wear, have been improved by the manufacturers, and experience with the later designs indicates that they should easily go between shoppings without more attention than renewal of rod packing, filter cloth, or an occasional gasket.

From the above remarks it will be clear that the committee believes the feed water heaters have now been proven to have reached a satisfactory stage as regards their dependability, and this, of course, is only another way of stating that the maintenance is low.

Conclusion

The fact that over one-third of the new locomotives ordered between March 1, 1922, and May 1, 1923, were equipped with feed water heaters, and the further fact that in addition to these a number of railroads have entered upon the program of applying feed water heaters to locomotives as they pass through the shop, clearly indicates the standing that this appliance has attained in the minds of those who have had the longest experience with it. The roads on which the largest number of feed water heater equipments are being applied or are now in use are those which have had two to four years' experience with equipments in service.

When it is further considered that the equipments to be obtained today have the improvements incorporated in them that the service of the earlier examples developed, it is the recommendation of this committee that the members proceed to obtain exact data and facts from railroads now having feed water heaters in service in considerable numbers, whose operating conditions may be similar to that of the investigators, with the idea of extending the use of the feed water heater as an economic device.

The report was signed by A. M. Boyd (G. T.), chairman, H. M. Sefton (Big Four), Wm. Grady (E. J. & E.), F. A. Callan (L. V.) and W. A. Buckbee (Superheater Co.).

Discussion

One of the members who has had experience with the closed-type heater said that this device makes working conditions for the enginemen and firemen easier, effects savings up to 15 per cent in fuel and reduces the number of water stops. In one case a run of 77 miles is made with but one stop and that for purposes of inspection. The heaters on this road have been run for six months without the necessity of removing scale. Locomotives equipped with feed water heaters are in great demand by the crews because of the smaller amount of fuel to be handled and increased power to handle heavy trains.

J. C. Simino (S. P.) stated that comparative tests have been made on the Southern Pacific under ideal conditions, such as level track, constant weather conditions and using oil-burning locomotives which enables accurate measures of both oil and water to be obtained. These tests showed that with a Pacific type locomotive having 22-in. by 28-in. cylinders, 77-in. drivers and 200 lb. steam pressure, the best results were secured with an 11-car train. This locomotive, when equipped with a feed water heater, consumed .49 gal. of oil per passenger car mile. Without a heater, the fuel consump-

tion was .60 gal. of oil per passenger car mile. The necessity of washing out the heater and keeping it clean, particularly in bad water districts, was strongly emphasized. It was also brought out that the real reason for the rapid development and application of superheaters to steam locomotives was caused more by the resultant increase in tractive capacity than in fuel economy and this same consideration is likely to prove most important in the case of the feed water heater.

In response to a question, F. J. Boyd (C. R. I. & P.), stated that he has experienced no difficulty due to water in the tank getting low and overheating. In one case the water was so hot that it blistered the paint on the outside of the tank and yet did not interfere with the operation of the inspirator.

E. E. Von Bergen (I. C.) said that good results have been obtained on the Illinois Central with exhaust steam injectors. Comparative tests show that when using this injector a smaller amount of fuel will maintain steam pressure under the same operating conditions as regards grade and load.

Address by J. M. Scott

At this point in the proceedings the members listened to the reading of a paper by J. M. Scott, general superintendent, West Virginia District, Baltimore & Ohio. Mr. Scott was unable to be present in person and the following is an abstract of the paper which was read for him: On most roads, at least for the past 10 years, the difference between what came in over the counter for transportation and what was paid out for wages, material and taxes left very little if anything in the cash drawer to pay dividends or make improvements. The fuel bill, after wages, is the largest single item of expense and fuel waste is brought about by the kind of man the traveling engineer or road foreman of engines takes into the service as a fireman. That is where the big waste begins.

Traveling engineers and road foremen of engines are all men of experience and that experience teaches or should teach them to be students of human nature. Their judgment should tell them 95 times out of one hundred whether they are hiring a man who in five years will make a road foreman of engines or traveling engineer, or whether they have a man who cannot see beyond the firebox door. If the latter is the case, for the benefit of the company they represent, for the people who use the road, for the coal pile and for the sake of the man seeking the position, they should not employ him because he might make good in some other line. A man seeking service as a fireman is usually 21 years old. If he cannot add and subtract quickly and accurately, some day after he has been made an engineman you are liable to hold an investigation, showing clearly that he made a mistake in the time of a first-class train he was moving against on a run-late order. Do not hire firemen unless they are timber for road foremen and presidents.

I do not underestimate the many duties of a road foreman of engines, the number of men he has to handle, the investigations he must hold, the days each week spent on the inspection pit, the long, weary hours spent writing up engine failures, or the Monday morning staff meetings. I still think, however, that some way or somehow you should stop permitting your clerk to put men in service before you actually look them over. It means too much. Some roads have employment bureaus that hire and send men out on the line. This may be all right for certain kinds of work but to my mind in order to get the best firemen or brakemen for the future and to help the coal pile, the road foreman of engines or the train master personally should know the applicant and pass on him before he actually becomes a member of the railroad family.

Too often a fireman is disinterested. He jumps off the locomotive as soon as it stops on the fire track. If in a siding on the road, he is either curled up on the seat half asleep, or over in the grass smoking a cigarette. Asked regarding such a man's qualifications for promotion the engineman would be obliged to admit that he did not know. On the other hand, if this fireman were constantly asking questions about train orders, machinery, etc., and at the end of the run asked the engineman to let him go around and locate things for the work report, the engineer to follow and point out what he had missed, then the engineman's answer to the road foremen's question would be: "You bet. I know all about that boy. Promote him and he will make good." It was extremely unfortunate for enginemen, firemen, road foremen of engines and the railroad we all work for when the invisible but nevertheless ever-present wall was built up between enginemen and the firemen.

Universal and Other Types of Brake Control

In order to limit the subject within reasonable bounds, reference is made only to passenger car brakes now in use. These, in the order of their introduction, are the P. M., L. N., P. C. and U. C. equipments. The development of brakes has been brought about by a need to meet the increasing demand for transportation and to bring about certain necessary results, the end in view being safety of life and property and increased traffic with minimum cost.

The conditions to be met included increased weights, higher running speeds and greater frequency of trains. The objects to be attained were : (1) More flexible control of the train, greatly reducing possibility of shocks; (2) more uniform braking power; (3) constantly recharging auxiliary reservoirs, which increases safety; (4) better protection against excessive braking power service applications; (5) shorter, smoother and more accurate stops.

An up-to-date brake must be reliable, flexible and effective; reliable in that it must operate when required, and if there are any failures, they will be on the side of safety; flexible, in that certain retarding force between a minimum and fixed maximum can be obtained as conditions require; effective, in that it will result in a moving train being brought to a stop in a reasonably short distance.

P. M. Equipment

The P. M. equipment, first introduced in 1887, was known as the quick-action brake to differentiate it from the plain automatic brake of 1872. As cars became heavier and service more frequent, the pressure was increased from 70 lb. to 110 lb. and the high-speed reducing valve was added in 1894. For modern cars, with large brake cylinders and long trains, the use of P. M. equipment is undesirable, because: (a) Its function is materially affected by length of train and condition of valves; (b) effective service applications cannot be obtained in quick succession due to the recharge all coming from the brake pipe; (c) of the liability of undesired

quick action due to the same piston controlling both service and emergency functions; (d) of the inability to obtain quick action after a service application; (e) of the possibility of brakes creeping on due to fluctuations of brake pipe pressure; (f) of the possible loss of braking pressure without warning; (g) of the necessity of using valves of different size for various size brake cylinders.

L. N. Equipment

The P. M. equipment gave satisfactory service until the railways put into use passenger cars requiring brake cylinders 16 in. to 18 in. in diameter with proportionate size auxiliary reservoirs. The large brake cylinders and auxiliary reservoirs meant greater volumes of air to be handled in a given time. Also, it was necessary on account of the increased length of trains to obtain means whereby a more uniform service application be made, and to obtain a better control of the release of brakes. To meet these conditions and requirements the L. N. equipment came into use in 1908. It has the same general features of the P. M. equipment, with the following added: (a) Quick service; (b) graduated release; (c) quick recharge of auxiliary reservoir; (d) high brake force in emergency.

P. C. Equipment

The P. C. equipment was designed to meet the demand made on the air brake by the introduction of cars weighing 120,000 lb. or more. Heavier cars brought about the adoption of heavier and more powerful locomotives and the average speed of trains was increased. All this required a more efficient brake. This equipment possessed all the features of the older types with the following additional features: (a) Fixed flexibility for service operations; (b) certainty and uniformity of service operations; (c) quick rise in brake cylinder pressure; (d) uniform brake cylinder pressure, independent of piston travel; (e) maintenance of brake cylinder pressure against leakage; (f) limiting of service brake force to a predetermined amount; (g) service and emergency features widely separated, although controlled by the same piston; (h) automatic emergency when brake pipe pressure is depleted; (i) emergency brake force obtainable at any time.

This equipment was only used on a few railroads and did not come into general use.

Universal Brake Equipment

The U. C. equipment was designed and introduced for the same reasons as brought out the P. C. equipment and contains all its essential features. This equipment is made up of the following parts: One U-12 universal valve; one auxiliary reservoir; one service reservoir; one emergency reservoir (when two brake cylinders are required two emergency reservoirs are used); one brake cylinder (two brake cylinders are used when car weight exceeds 153,000 lb.; one conductor's valve; one centrifugal dirt collector; the necessary cut-out cocks, angle cocks, hose couplings, etc.

In order to obtain all the benefit from Universal Brake Control it is essential that an efficient foundation brake gear be provided. Up to recent years it was the prevailing practice to equip car trucks, of either the four or six-wheel type, with brake rigging having but one brake shoe per wheel. With such a brake rigging it is impossible to keep the piston travel uniform. The shoe is hung below the center line of the wheel and when the brake is applied, brake hangers are pulled down, piston travel is lengthened, thereby increasing cylinder volume and causing a cylinder pressure less than should be obtained and a longer time than should be required to obtain it.

The disadvantages of using this type of gear may be summarized as follows: (a) Rough handling in starting due to violent taking of slack, slowing down and stopping due to slack action in train caused by unequal piston travel; (b) inability to make time because of train pulling hard on account of short piston travel, resulting in improper amount of shoe clearance and dragging brake shoes; long drawn out stops due to the engineer trying to avoid shocks by "dribbling" brakes on; (c) useless expense in excessive fuel and water consumption and reduced locomotive capacity due to the power necessary to overcome shoe friction; slid flat wheels due to uneven distribution of brake force; damage arising from shocks and break-in-twos as the result of short piston travel; hot boxes due to journal being pushed from under brass when brake is applied; burned brake shoes due to rubbing on wheel tread while brakes are released.

The clasp brake type of gear provides two brake shoes per wheel, hung practically on the center line of the wheel; this arrangement makes it possible to maintain piston travel constant for all cylinder pressures. The engineer is enabled to obtain the desired pressure with a given reduction of brake pipe pressure, thus insuring greater accuracy and smoothness in making stops. The brake shoe pressure is divided between two shoes and there is less wear of shoe metal.

It is well known that efficient handling of any train is the proper control of slack. All shocks are brought about by a sudden change of velocity of different vehicles in the same train, and the brake that will produce an effective retarding force with the least change in velocity between the front and rear portions of a train must be the best. Such a brake is one that when a brake application is desired, the brake pipe reduction and rise in cylinder pressure will occur simultaneously on each car in the train. The universal valve electrically controlled will do this efficiently and consistently.

The report was signed by Russell M. Smith (Penn.), chairman; H. H. Burns (Westinghouse Air Brake Company); E. F. Wentworth (New York Air Brake Company); J. R. Scott (St. L.-S. F.); Wm. Smith (B. & A.), and Jas. Fahey (N. C. & St. L.).

Discussion

There was a long discussion of this report, one of the things which received the most attention being the graduated release feature. Several of the members maintained that it was advisable to use this equipment in direct release in view of the fact that mixed trains must be run. Other members strongly advocated having the graduated release cut in whenever 50 per cent of all of the cars have this feature. The advantages are a much better and more accurate control of passenger trains on descending grades and when making station stops. There is also a considerable decrease in air and consequently fuel consumption.

The possibility of getting an emergency after a service application with this equipment was pointed out, which is an advantage from a safety point of view. Care must be exercised not to get an emergency application at low speed, however, owing to the possibility of pulling out a drawbar. Another advantageous feature of this equipment is that by means of a special cut-out cock in the brake cylinder pipe, the brake on the car can be released without losing the reservoir pressure. This enables brake shoes to be replaced or brake rigging repaired without interfering with train line pressure or the reservoir pressure which maintains water level in the car. Another point which received considerable attention was the use of a back-up or tail hose when backing trains into stations, difficulty being experienced in getting accurate stops with this method.

President Kirby (B. & O.), summed up the matter in the statement that every train operated under normal conditions into Washington, D. C., is backed into the station by the engineman, operating the engineer's brake valve in accordance with communicating signals from the conductor on the rear end. Exceptions to this rule are infrequent.

Advantages of Oil as Fuel for Locomotives

The most important consideration governing the use of oil as a fuel is the relative cost and extent of supply. At the present time the production of oil exceeds consumption and the prevailing price coupled with the advantages of fuel oil invites consideration of its extended use as a locomotive fuel.

During the year 1922 a total of 44,752,344 barrels of fuel oil were consumed by locomotives in the United States on the principal railroads, which showed a gain of over four million barrels over 1921. Thirty-two million barrels of the total was domestic oil and 12 million barrels was imported from Mexico.

A check of fuel consumption under operating conditions showed that 3.32 barrels of oil was equal to one ton of coal 12,500 B. t. u., and 2.68 barrels equal to one ton of coal 9,810 B. t. u., the heat value of the oil being 18,500 B. t. u. These figures take into account the various losses.

Efficient Design.—All oil-burning locomotives were primarily designed to burn coal, and notwithstanding the high boiler efficiencies attained with the present oil-burning locomotives, some authorities believe that higher efficiency could be attained if the oil-burning locomotives were especially designed to burn oil. In the combustion of oil the particles of oil are on their way to the flues before they are even partially consumed. If these particles were attached to a bed of coals a supply of air could easily complete their combustion, but with oil a mixture of air and the ignition must take place in a very limited time, therefore it is realized that large furnace volume is essential to the burning of fuel oil. While the dimensions are of minor importance to the volume, it is evident that a flameway must be provided of sufficient length to prevent unconsumed particles of fuel striking the flues.

Productivity.—With oil fuel the productivity of the locomotive is increased, as either the tonnage or speed are increased, due to the fact that with oil the maximum boiler capacity is available at all times and the engineer does not have to work the engine below the capacity of the man with a scoop shovel. The tonnage increase is generally accepted as 15 per cent. Less time is required to turn an engine, as there are no fires to knock or flues to bore, which increases its actual productive time in a 24-hour period. Hostler service is reduced and ash pit service is practically dispensed with.

Maintenance.—Maintenance favors the oil-burning locomotive, as there are no grates or grate-shaking apparatus to maintain. Brick arches and arch tubes are dispensed with. The maintenance of the stoker is eliminated and the draft arrangement does not have to be altered for different grades of fuel as with coal.

Handling, Storing and Distribution.—The cost of handling oil is cheaper than the cost of handling coal, as it is economically distributed through pipe lines, and the switching charges are less at fueling stations. The necessity of maintaining separate bunkers for different kinds of coal is eliminated as fuel oil is practically uniform in character. The expense of complicated conveyors, hoists and other elaborate devices for handling coal is dispensed with. There is a reduction in the number of fueling stations due to the increased fuel capacity of the oil-burning locomotive. In some localities oil pipe lines parallel the railroads. In these cases the cost of transporting railway fuel is greatly reduced and distribution is simplified. Fuel oil is not subject to spontaneous combustion—coal is. Fuel accounting is simplified, as with oil there are no losses from fuel falling from cars and tenders enroute, and there is more accuracy in fuel measurements with oil. This feature enables the compiling of accurate individual performance sheets of engineers, firemen, and engines, which is an incentive to the economical use of fuel.

Improved Operating Conditions.—With oil fuel there is greater cleanliness, as there is a reduction in the amount of smoke, freedom from dust, ashes and cinders. This feature is of great value around large city terminals and is an asset to passenger service. It is easier to maintain a steady steam pressure with smaller losses at the pops, and the intensity of the fire can be almost instantaneously regulated to meet load fluctuations. From a safe operating standpoint it permits the firemen at all times to be in a position to observe signal indications and operating rules and check the engineer against any oversight. The fire hazard is greatly reduced, as there are fewer incandescent particles passing from the stack with an oil-burner. Most all the advantages of oil as a fuel in locomotive practice apply equally well in railway stationary plants.

Conclusion.—The advantages in favor of burning fuel oil are so numerous that it might seem that the railroads not burning oil were being inefficiently operated, but such a conclusion would not be justified in view of the fact that sufficient oil is not produced in this country to operate all the railroads but for a short period of the year. If all the coal-burning railroads were to convert their locomotives to oil-burners it would require a total of approximately 444,000,000 barrels, which is almost twice the amount of oil produced in 1922. It is evident from these figures that fuel oil cannot replace coal as a locomotive fuel with the present production, except to a limited extent where conditions are favorable. The report was signed by J. N. Clark (S.P.), Chairman, Robert Collett (St. L.-S. F.), C F. Richardson (West Kentucky Coal Co.), W. G. Tawse (Superheater Co.), V. Villette (Westinghouse Air Brake Co.).

Discussion

The chairman of the committee pointed out that the figures on oil production and consumption in the United States, as given in this paper, were compiled in May. Since that time three new oil fields have been discovered in California and in view of their production these figures are badly out of line. One of the members stated that the use of fuel oil will revolutionize locomotive operation, enabling far better results to be obtained with both crews and power. Old power was also said to hold up better when burning oil than coal, largely due to reduction of severe expansion and contraction strains particularly in the firebox. Questioned as to the smoke sometimes developed when burning fuel oil, one of the members said that the only time smoke is observed coming from an oil-burning locomotive is when the latter is improperly operated. Another member expressed the opinion that for best results the flame should travel about five feet before striking an obstruction. The consensus of opinion was that the installation of fuel oil burners increased the capacity of locomotives in the neighborhood of 15 per cent.

Election of Officers

In accordance with the usual custom the officers of the Traveling Engineers' Association were advanced, the officers for 1924 being as follows: President, T. F. Howley (Erie); first vice-president, W. J. Fee (Grand Trunk); second vice-president, J. N. Clark (Southern Pacific); third vice-president, J. B. Hurley (Wabash); fourth vice-president, J. D. Heyburn (Frisco); fifth vice-president, James Fahey (Nashville, Chattanooga & St. Louis); treasurer, David Meadows (Michigan Central). Four members of the executive committee were continued in office, J. C. Simino (Southern Pacific) being elected to the committee in place of James Fahey who has been made fifth vice-president.

Rail Conditions Brought to Attention of President

WASHINGTON, D. C.

EFFORTS ARE BEING MADE in various quarters to induce President Coolidge to try to use his influence with the Interstate Commerce Commission to bring about certain reductions in freight rates which the commission itself up to the present time has not decided, as the result of its own investigations, ought to be made. The letter from Governor Pinchot to the President, suggesting that the commission should consider anew the rates on anthracite coal with a view to reducing them if possible, which was written about two months after the commission had ordered such an investigation on the recommendation of the U. S. Coal Commission, is one case in point. Similarly the President is being urged by various people, including Senator Capper, to try to bring about reductions in rates on agricultural products, particularly wheat. There has as yet been no indication, however, that the President regards the idea at all practicable.

In the official information given to the Washington correspondents at the White House on Tuesday, following a Cabinet meeting at which the situation of the farmers and various suggestions for its improvement were the principal topic for consideration, various causes for the present unfortunate condition of the wheat farmer were mentioned without any reference to freight rates as being one of them. It was announced that the Secretary of Agriculture was making a special study of the wheat situation for a report to be submitted to the President later in the week and Secretary Wallace has recently expressed the opinion that certain reductions in rates should be made for the benefit of the farmer. Secretary Hoover also told the newspaper men on the following day that a general readjustment of freight rates is fundamental to an improvement in agricultural conditions. Mr. Hoover's idea, however, as expressed on several previous occasions, involves an increase in class rates, or at least rates on the kind of articles that could best stand an advance, as an offset to reductions on agricultural products and perhaps some others moving on commodity rates. Also Secretary Wallace has usually tempered his statements that grain rates ought to be reduced by reservations relating to the ability of the railroads concerned to stand a reduction in revenues, and in a recent statement he recognized that the western roads are not doing so well as those in the east in urging that the latter reduce export grain rates.

Senator Capper is understood to have urged a reduction in grain rates during a conference with the President on Monday.

Following the Cabinet meeting, it was officially stated as indicating the views of the President, that the condition of the producers of corn, cotton and livestock is now relatively favorable, but that that of the wheat farmer has been affected by the reduced demand for his product from Europe and also to some extent by reduced consumption of wheat in the eastern industrial districts where higher wages and a higher standard of living have led to a greater consumption of meat and less dependence on cereals. It was stated that the President desired to do everything possible to relieve the situation by bringing the condition of the wheat farmer to a sound economic basis rather than by the use of temporary expedients and that possibly regional conferences would be held after the receipt of the report from Secretary Wallace.

While there have been some rumors to the effect that rate reductions will be recommended to the President as the most direct means of benefiting the farmers, consideration of other factors in the situation suggests that there is little likelihood of anything immediate being done along that line. The Interstate Commerce Commission has had a formal case involving a demand for reductions in western grain rates before it all summer and no action on it has yet been announced. Secretary Wallace has heretofore usually given consideration to the condition of the roads and Secretary Hoover's expressions on the subject have always been directed toward a general readjustment of the rate structure such as would inevitably take a long time to work out. He has also stated that the western grain carrying roads are not in a position now to reduce rates and has looked forward to consolidations of the railroads under the plan not yet completed by the commission, as tending to make possible some readjustments that could not now be made because of the great dependence of individual roads on certain classes of traffic.

President Coolidge has taken cognizance of the great improvement in railroad transportation conditions during recent months and has received very encouraging reports leading him to feel that there is little danger of a car shortage this fall and winter. The President has been informed that by reason of the expenditure of some $1,500,000,000 the railroads are now well equipped to handle the heavy traffic being offered and comment was made on the contrast presented this year with conditions which he observed during a western trip last year.

Hale Holden, president of the Chicago, Burlington & Quincy, and chairman of the executive committee of the Association of Railway Executives, and Alfred P. Thom, general counsel of the Association of Railway Executives, called on President Coolidge at the White House on September 13 and tendered the co-operation of the railroads in furnishing him with any data or information he might desire at any time relating to transportation questions.

A Love Feast with Shippers

VISITING 2,000 PATRONS in three days, was the achievement, recently, of M. Seargeant, superintendent of the Atlanta division of the Louisville & Nashville; and from a diary made on the trip (which was by a special train, carrying 12 officers of the operating department and eight of the traffic department) it would appear that a good share of the "visits" really deserved that name. About one thousand represents the aggregate number of citizens gathered in halls, or in outdoor meetings, for formal addresses, at the larger places where the train stopped; but, judging by the enthusiastic language of the diarist, these people were just as much in love with the "L. & N." as were those of the other thousand, who, in groups of 10 or 15, were met at the 10-minute stops made at the smaller stations, where there was general handshaking and conversation all-around.

The trip was an inspection trip, but was designated as one of "boosters," out to advertise the virtues of their road; though from the close connections made with the shippers at each stop, and the optimistic spirit everywhere evident, one naturally concludes that most of the real boosting was done by letter or special invitation before hand. And even the letters must have had little urging to do; for, so far as appears from this diary, every shipper was a warm friend of the road already. Possibly, however, a separate diary was kept for the purpose of taking care of any complaints which might be received. Surely, if every shipper from Etowah to Atlanta is wholly free from those grievances, petty or otherwise, which go to make up the life of the claim department, that beautiful section of Georgia must be very near to heaven. Possibly the feasts of watermelon and lemonade which characterized the gatherings at Chatsworth, Woodstock, and other places put everybody in such good humor that all past unpleasantnesses were wiped out for good and all.

The special run referred to, which was begun on August 22, included stops at 25 towns.

The Missouri Pacific's New Hospital at St. Louis, Mo.

Missouri Pacific Hospital Dedicated at St. Louis

Utility and Beauty Feature Million-Dollar Structure Built by Employees of the Railway

WHAT IS BELIEVED to be the finest railway hospital in the United States or Canada has been completed at St. Louis, Mo., and placed at the disposal of its virtual owners, the employees of the Missouri Pacific, and their families, following dedication ceremonies on July 28. The institution is a million-dollar structure in which every effort has been made to secure utility in design and completeness in equipment. Equipped to the point of having a chapel for religious services, attractive quarters for nurses, a stage for entertainment, billiard rooms, etc., and providing for the separate hospitalization of colored patients, the institution constitutes the latest achievement of the Missouri Pacific Hospital Association, an incorporated association of all Missouri Pacific employees, which also maintains hospitals in Kansas City, Kan., and Little Rock and Monroe, Ark., and provides for emergency service or pre-medical attention at some 260 additional points.

The Reception Corridor for Guests Indicates the Interior Treatment of the Building

The new hospital is a six-story structure with basement on ground floor, situated on a 233-ft. by 267-ft. plot of ground at the intersection of Grand and Shaw avenues, where it faces a 40-acre park, one of the highest points in the city. The building itself is 133-ft. across the front with 123-ft. wings at each end. It contains 278 rooms, 119 of which are sick rooms containing 300 beds in all. All bed-rooms are outside rooms well lighted by windows. No room contains more than four beds and the majority only two beds. The building is a reinforced concrete structure with interior partitions of gypsum block, the door frames and much of the furniture are of metal and the floors of tile or terrazo to afford the maximum protection against fire. The first two stories of the building are faced on the exterior with algamite and the remaining area with buff bricks while the trim, including the quoins, cornices and coping, is of stone. The roof of the building is arranged to serve as a promenade and is covered with red tile. The building is surmounted by a sun parlor, also roofed with red tile. At the end of the wing on Shaw avenue and connected to the main building by a covered passageway, is the hospital for colored patients. This is a 42-ft. by 88-ft. building of two stories with two sun parlors at the end. It is of the same construction as the main building and provides capacity for 30 patients.

The main doors of the building are reached by a flight of wide steps and open into a spacious lobby which is walled with white Italian marble, with columns of the same material extending upward two stories to a heavy beamed ceiling. Directly over the lobby and surrounding it is a balcony.

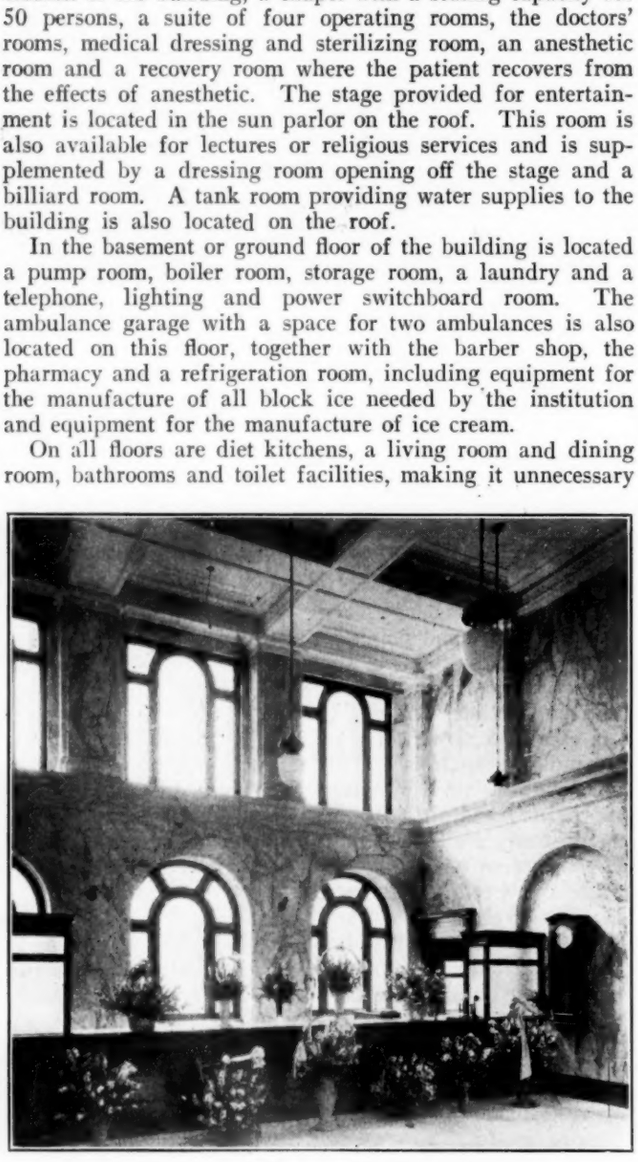
The Floor Arrangement

Located on the main floor of the building are the administration offices, including those of the president, chief surgeon and superintendent, the business offices and a waiting room, together with a consultation room, the physicians' offices, the medical library, an X-ray room, clinic dressing rooms, laboratory, the hydro therapeutic or water cure room and a

gymnasium. Quarters for women patients are located on the second and third floors, the second floor being occupied entirely by these rooms, while the third floor also includes the living quarters for the resident physicians. Both floors have sun parlors and medical dressing rooms. The fourth and fifth floors are for male patients and are also provided with two sun parlors and medical rooms. The nurses' quarters are located on the sixth floor, where there is also the main kitchen of the building, a chapel with a seating capacity for 50 persons, a suite of four operating rooms, the doctors' rooms, medical dressing and sterilizing room, an anesthetic room and a recovery room where the patient recovers from the effects of anesthetic. The stage provided for entertainment is located in the sun parlor on the roof. This room is also available for lectures or religious services and is supplemented by a dressing room opening off the stage and a billiard room. A tank room providing water supplies to the building is also located on the roof.

In the basement or ground floor of the building is located a pump room, boiler room, storage room, a laundry and a telephone, lighting and power switchboard room. The ambulance garage with a space for two ambulances is also located on this floor, together with the barber shop, the pharmacy and a refrigeration room, including equipment for the manufacture of all block ice needed by the institution and equipment for the manufacture of ice cream.

On all floors are diet kitchens, a living room and dining room, bathrooms and toilet facilities, making it unnecessary



The Marble Walled Main Lobby on Dedication Day

to remove patients from the floor on which the bedroom is located. Communication between the floors is afforded by stairways and by two automatic electric passenger elevators. There is also one automatic electric freight elevator connecting all floors and an incline passage-way from the sixth floor to the sun parlor on the roof.

The walls of all of the rooms are either tile or covered with white enamel, except the bed rooms which are decorated in subdued colors. The bed room floors are completely covered with cork tile while the corridors are provided with a runner of the same material. For convenience and cleanliness, clothes chutes lead from all the floors to the laundry in the basement, in itself a model plant, fully equipped, while dust chutes are also provided, discharging into a refuse incinerator, the heat from which is utilized in heating the water for the hospital. The heating in the building is automatically regulated to avoid fluctuations in temperature of the rooms and, chiefly for sanitary reasons, the radiators in the operating rooms and wherever possible elsewhere, are hung from the walls, affording a minimum area for dust to accumulate. Also for the sanitary advantage, all corners and the junction of floors and walls are rounded to permit easy and thorough cleaning.

Among the features of the building which stand out especially prominent is the arrangement of the operating rooms, which are so located in one of the wings of the building that the entire side of each room is in windows which also extend over part of the ceiling, insuring an abundance of uniform light. Another feature deserving of mention is the kitchen located on the sixth floor. Here all food for ambulatory patients is prepared and sent on two dumb waiters to the serving and dining rooms on the various floors. This kitchen is equipped with five hotel ranges, bake ovens, an electric mixer, electric meat chopper, two large steam kettles, a steam table, an automatic electric dish washer and other modern equipment.

Each bed room is equipped with two lights on the ceiling, a bright light for reading and a subdued light, while a bracket light is located over each bed. Of special interest in connection with the bed rooms is the call system whereby a patient operating a push button on an extension cord within easy reach simultaneously turns on three lights, first, one in the room which shines against a bull's eye and is reflected into the hall in front of the door of the bed room, second, a light on an indicator in the nurses' room, and third, a light on an indicator in the superintendent's office. To extinguish the three lights the nurse must answer the call and push the button in the patient's room.

The boiler room in the basement contains three 90-hp. boilers and a vacuum return heating system. Three centrifugal pumps elevate the water to the tank on the roof, and an ice water tank in the same room with the pump cools the water to a temperature of 40 deg. prior to its circulation through the building. Facilities are provided in the basement for the sterilizing of all bedding and clothing.

The patients are brought into the building through a receiving entrance on the court at the rear of the hospital where the space between the receiving entrance and the ambulance is covered by a glass canopy to afford the desired protection from winter weather. The patient is then carried by special elevator to the clinic dressing room on the first floor where suitable bathing facilities are provided. If an immediate operation is required the patient is placed on an emergency operating table, otherwise he is removed either to a bed room or to the operating rooms on the sixth floor.

Employees Have a Voice in Management

The new hospital was financed by subscriptions of from $4.20 to $10.80 contributed outright by the Missouri Pacific employees and from assessments paid by the employees as shareholders of the Missouri Pacific Hospital Association. This association was organized in 1876 and since its reorganization in 1912, is a corporation in which each Missouri-Pacific employee holds one share of stock and which is controlled by a board of nine managers representing the various crafts, the officers and the employees not included in various brotherhoods. The chief surgeon is an ex-officio member of the board and of the committees. H. J. Mohler, former general chairman of the Order of Railroad Telegraphers, is the president of the board; while J. F. Murphy, general manager of the Missouri Pacific, E. T. Johnson, general auditor, and E. A. Hadley, chief engineer, are members. C. H. Wray and E. M. Tucker, architect of the Missouri Pacific, were the architect and supervising architect respectively of the new building.

Roadmasters' Hold Annual Convention In Chicago

Forty-first Consecutive Meeting Characterized by Active Discussion of Track Maintenance Problems

MORE THAN 300 ROADMASTERS AND ENGINEERS responsible for the maintenance of tracks gathered at the forty-first annual convention of the Roadmasters' and Maintenance of Way Association at the Hotel Sherman, Chicago, on September 18-20. The meeting was characterized by the consideration of the broader phases of the responsibility of the members of this association for the welfare of the railways as a whole. In addition to reports dealing with the more intimate problems of track maintenance, addresses were presented by railway officers emphasizing the necessity of the roadmasters participating in the solution of the problems confronting the railway industry as a whole.

The meeting was one of the most successful in the history of the organization. The officers who have directed its activities during the past year were: President, J. P. Corcoran, roadmaster, Chicago & Alton, Bloomington, Ill.; first vice-president, J. B. Martin, supervisor, New York Central, Elkhart, Ind.; second vice-president, W. F. Muff, roadmaster, Atchison, Topeka & Santa Fe, Newton, Kan.; secretary, P. J. McAndrews, roadmaster, Chicago & North Western, Sterling, Ill., and treasurer, T. F. Donahoe, general supervisor of roads, Baltimore & Ohio, Pittsburgh, Pa.

In calling the convention to order on Tuesday morning President Corcoran emphasized the fact that the members of the Roadmasters' Association are now called on to participate in the most active discussion of the railway situation which has ever been conducted. The attempts of a certain group of politicians to force the railways into government control calls for activity on the part of every railway employee in the dissemination of the facts regarding the railways. No group of railway men comes more intimately in contact with local merchants, public officers and politicians than the roadmasters in traveling over their subdivisions. It is, therefore, necessary for every maintenance officer to inform himself regarding the justification for present rates in order that the roads may be able to maintain their tracks and structures in a condition which will enable them to render the public the service which it demands. The American public is inclined to be fair and to display sound judgment when it is in possession of all of the facts and railway men owe it to their roads to see that all with whom they come in contact are fully and correctly informed.

In conclusion, Mr. Corcoran referred to the fact that the roads are approaching the end of the most active season for many years. Railway traffic is moving in unheard of volume. New records are being broken almost weekly on nearly every road. This traffic is increasing the wear and tear on tracks and structures and all indications point to its continuance throughout the winter. It is, therefore, important that track men shall now give due consideration to the burdens which will be placed upon their rails this winter in order that they may utilize as efficiently as possible the few weeks that remain in bringing their tracks up to the best possible condition before the roadbed becomes frozen.

Hal Ray Presents the Public Relations Problem

Hal S. Ray, director of personnel and public relations of the Chicago, Rock Island & Pacific, presented the responsibility of roadmasters in disseminating correct information regarding the railways in a forceful manner. After emphasizing the importance which transportation plays in the industrial life of our country, he stated that there is now a greater need than ever before for every loyal railroad man to present the facts about the roads before those with whom he comes in contact. In this day when so many public men are endeavoring to discredit the roads, it is necessary for the effect of their attacks to be counteracted with facts. The constant misstatements of men in public life are undermining the credit of the roads and the service which the public demands.

Mr. Ray referred to the fact that the departmental organization of the railways leads to the belief on the part of many that if a man performs his departmental work properly he has done his duty. He then described the broader phase of each man's responsibility in the complex industrial fabric of the country and referred to the necessity for every man to work beyond the limits of his department in protecting the interests of the transportation industry as a whole. He described the manner in which the roads were sought after in the earlier days and the way in which land values increased, towns grew and the country prospered following the construction of the roads. He deplored the fact that this attitude has now changed in many quarters, due to the constant dissemination of misformation by those politicians who have selfish purposes to gain. He then dwelt at length on the misstatements which are disseminated most widely, including the so-called guarantees and valuation, whose purpose is to enforce government ownership of railways.

Mr. Ray closed with the statement that no group of men has a better opportunity to present the facts to a large proportion of our population than the roadmasters who are constantly coming in contact with the public. The future of the roads is at stake. The question whether they shall continue to develop the industrial life of our country or whether selfish politicians shall be allowed to break down what has been built up rests with the railway men.

Following Mr. Ray's address, the association proceeded to the consideration of the reports of its committees.

Mr. Bierd Addresses Convention

W. G. Bierd, receiver of the Chicago & Alton, addressed the convention Wednesday afternoon on the railroad question. Reviewing in brief the status of the roads before the European War, he showed how war conditions were seized upon to effect what certain individuals had long sought—Government control. Although subsequent events demonstrated the fallacy of this scheme of management with the result that the roads were returned to their owners, it brought about certain fundamental obstacles to efficient operation which the managements are still trying to overcome and which are primarily responsible for the present inadequacy of rail transportation in this country. The effect of this condition on the public has been manifested in hysterical efforts to enact further legislation. Legislation, he said, will not make the roads more efficient or increase their ability to handle traffic. What the roads need is an opportunity to solve their problems unhampered by additional laws or other interference. He urged each roadmaster to utilize to the utmost his advantageous position to restore confidence among the employees in their managements and to impress the public with the fact that what the roads need is to be let alone.

The annual dinner of the Roadmasters' and Track Supply Association was held on Wednesday evening with an attendance of 417. The speaker of the evening was F. W. Sargent, general solicitor of the Chicago & North Western

who outlined the principal contentions of those behind the organizations in opposition to private ownership and operation of the railroads and exposed the fallacies of the arguments with respect to valuation, land grants and the effect of squeezing out seven billions of "water." The time is here, he said, when if our transportation systems are to expand with the progressive development of the country and rates maintained on a basis reasonably satisfactory to all we must take our railroads out of the realm of political discussion and deal with them in a businesslike way.

Report on the Maintenance of Large Yards

The maintenance of large yards and yard tracks covers a much wider scope of activities than ordinary main track work because of the many different conditions that affect it. Among these are the constant interruption by yard operations, the many different kinds of tracks to be maintained, the kinds of loads passing through the yard in different directions, the greater number of heavier loads moving over one part of the layout than another, the weight of the engines used and the character of the sub-grade on which the yard is constructed.

A properly balanced maintenance force should be developed by sections on an equated mileage basis, taking into consideration not only the mileage of the different classes of tracks, the number of switches and the drainage conditions involved, but also the special operating conditions affecting each section, so that they are all as nearly equal as possible in the amount of work to be done. While there is no maintenance work that suffers more interruptions than yard work, and no kind as difficult to plan and execute, the planning of work by seasons and close supervision to assist in its being carried out as nearly as possible in accordance with the schedule is very necessary.

One method of preparing such a program which has been used with distinct advantage, is for the supervisor to go over each section with the foreman in charge early in the year, to make a careful study of the maintenance needs of the section and then prepare a schedule of the different stretches of tracks to be worked during the year in the order of their importance.

Of course, no such schedule, particularly one of yard maintenance, can be followed to the letter. Many things develop to interfere with a definite plan, but notwithstanding this, the increase in the volume of work accomplished during a season with such a carefully mapped program is very marked. This is not only a decided advantage to the foreman, but probably even more so to the supervisor, as it makes him familiar with all of the detail problems of his year's work.

Another very important measure in promoting yard maintenance is to reduce the paper work required of the foreman. His reports should be cut down to keeping time, reports of accidents due to track conditions and monthly reports of gage, line and surface conditions, etc., for which he is directly responsible. All other current reports should be handled by some one delegated by the supervisor, who can handle this work for several sections or for a whole yard of moderate size.

Except a small supply for emergencies, materials should be located in a material yard as centrally located as possible, with supporting tracks so that the unloading and loading will not be interfered with by the yard operations. Rails and other heavier materials should be handled by small derricks or rail loaders, and only distributed for use when needed.

The advantage of using heavier rails in yards is frequently overlooked. Rails in all yard tracks should be at least of 85-lb. section. First- or second-class fit rails are satisfactory, the first-class rail to be used on the more important running tracks and ladders. This plan will materially reduce the cost of ties, and of lining and surfacing, and will effect a saving more than equal to the cost of the additional weight of rail applied.

Many Things to be Watched

Many maintenance practices followed to excellent advantage on road work, but given less consideration in yard maintenance, are suggested as worthy of special consideration as applied to yards:

a. Adequate drainage.
b. Application of switch point guard rails ahead of the sharper leads.
c. Application of rail anchors where needed.
d. Tie plating of all main engine and ladder tracks throughout, and all other tracks where traffic develops mechanical wear of the ties.
e. Milling of stock rails to increase the life of switch points.
f. Carefully supervised joint maintenance.
g. Careful distribution of ties and rail, taking into consideration the tonnage handled over the different tracks, and the subgrade conditions.
h. Monthly reports of track condition, as to gage, line, surface, etc., made by the foremen after careful personal inspections.
i. Careful study and the adoption of labor saving devices.

Co-operation With the Transportation Forces

One of the most important factors in getting results in yard work is co-operation. Allotments of labor and material mean far less, and suggestions for good practices and their application are less effective if there is no real co-operative spirit between the supervisor and his forces, as well as between the maintenance of way department and the transportation organization. Any work that will necessitate the absolute use of a track for a few hours or more should be anticipated sufficiently in advance by the foreman or supervisor to enable the yardmaster to plan accordingly. On the other hand, in making track repairs no materials should be left lying between the tracks of yards or adjacent to any tracks.

A spirit of helpfulness on the part of the supervisor with respect to the foremen is of great importance. Railroad organizations, to be stable and lasting, must be built on loyalty, and loyalty is developed only by co-operation and helpfulness, which should be manifested at all times. There is no sub-officer more favorably situated to help his company and the company's organization in this respect than a track supervisor.

R. W. E. Bowler, division engineer, Pennsylvania, Toledo, Ohio, is chairman of the committee.

Discussion

The discussion of this report emphasized the necessity for adequate supervision in yards, the use of labor-saving equipment and the laying of yard tracks with rail of adequate weight properly supported on a sufficient number of ties. D. O'Hern (E. J. & E.) outlined the organization in effect on his road. In all yards of considerable size track work is under the direction of a general foreman, with one or more assistants, or the yard is divided into one or more sections, each in charge of a foreman. Large motor cars capable of handling two push cars loaded with switch material, clamshell buckets for loading dirt, cranes equipped with magnets for handling scrap were cited as illustrations of mechanical equipment directly applicable to yard work. In discussing the need of adequate weight of rail in yard tracks, J. W. Powers (N. Y. C.) stated that his road used 105-lb. rail released from freight tracks on heavy traffic running tracks in yards.

Reducing Injuries Among Trackmen

By H. B. Mayo
Superintendent of Safety, Southern Pacific Lines, Houston, Tex.

No work in which human beings are included may be considered as efficient unless the factor of safety is a fundamental principle and one engaging the attention of all supervisory officers, who must at times be prepared and willing to subserve other conditions and considerations that the well being of their men may be maintained. The word "efficiency" has been long a synonym of harmonious and well directed effort.

Frequently this efficiency has been maintained without regard for expense as represented by actual money or by a depleted man power created by incapacity due to accident—the individual injury, often figured in as part of the day's work and a feature of the job.

I am of the opinion, however, that, whatever may have been the case in the past, the present periods are characterized by a determined effort to ameliorate working conditions in maintenance circles, so that by a combined effort, housing, sanitation, devices, tools, hours of labor, wages and working conditions are gradually being improved with a coincident reduction of casualties caused by any or all of the factors suggested, while methods based upon practices properly determined are curing many evils of an individual nature.

I am inclined to believe that the character of supervision is largely reflected in whatever freedom from accident a particular gang enjoys. So, too, the opposite—that an undue number of avoidable injuries to the employees reflects upon the supervising officer. This may not appeal to you, but the records will bear me out, for it is a fact that the foreman who permits careless practices on the part of his men; who encourages slip-shod methods by a failure to correct manifest negligence of rule violations, will show the greater number of personal injuries and loss of time. An examination of records will show that some foremen have few or no reportable injuries, while others are quite the reverse. Measure the results by methods and the answer will probably be revealed.

Therefore we must look to supervision generally in all departments of maintenance for a reduction in the thousands of unnecessary injuries that now clog the records of the Interstate Commerce Commission and that mar the history of accomplishment as applied to the various departments of railroad operation. You men who supervise may not escape the direct responsibilities which are undoubtedly yours, and any lack of interest on your part will more than likely be followed by a corresponding failure on the part of your subordinates.

A cursory study of statistics presented by the Interstate Commerce Commission reveals some interesting features. One finds that on some well regulated lines the man-hours per injury in track and bridge and building work far exceed the records of the lines equally well operated, working under similar conditions and employing the same class of men. The question then involved is as to the character of supervision and the extent to which the roadmasters and foremen have assimilated the real principle of safety and the degree of time and interest they devote individually and collectively to the education of their men in safe practices and the use of safe and adequate tools and appurtenances.

Decrepit tools and appliances are continued in use because of the trouble necessary to get new ones or to make the old ones good; unsatisfactory methods are permitted to remain in effect because they often represent the line of least resistance as compared to the labor of educating the workers, many of whom are new men, since the labor turnover is large in unskilled ranks. To this turnover is undoubtedly due injuries that the old men sidestep by experience, for it is a fact that in gangs made up of men long on the job, months will elapse without a reportable injury, while the reverse is true with gangs the personnel of which is constantly changing.

With the lines employing foreign labor, Mexicans chiefly, the turnover is at times excessive. The difficulties of educating this class in safe practices are numerous. Also with such labor, largely illiterate and ignorant of the language spoken by the foreman, there appears to be a disposition to get fingers and toes where they do not belong, and when the men learn that an injury frequently means compensation when off duty, many of them take advantage of the opportunity thus presented. Safe methods are quite possible, as experience has determined the unsafe ones, and they will vary according to conditions. The problems are serious, but despite this, results are improving year by year, and when the roads shall finally be permitted to operate minus perplexing wage and legislative turmoil so characteristic of the past few years, I believe that we shall show a much better balance sheet on our casualty account. However, the call of humanity will always be in our ears and every possible effort is justified in order that we may better the condition and safety of the thousands of our people associated with the maintenance of our railroads, a work, the importance of which is second to no other feature of our operation.

Discussion

This paper was discussed at considerable length. Several men pointed out the influence of a high labor turnover on the number of accidents. Special reference was made to the increasing number of collisions between section motor cars and automobiles at highway grade crossings. As protective measures a number of roads equip their cars with gongs, whistles or bells while others require their men to reduce speed to six miles per hour or to stop before reaching a crossing.

The Results of Tie Treatment on the Santa Fe

By S. D. Cooper
Assistant Manager, Treating Plants, Atchison, Topeka & Santa Fe, Topeka, Kan.

The Santa Fe commenced to treat ties in 1885 at Las Vegas, New Mexico. From that date until 1901 ties were treated by the Wellhouse process, which is a combination of chloride of zinc, glue and tannin. From 1902 to 1905 we used the Burnettizing process, which is a treatment with chloride of zinc only. In 1906 we commenced to treat all ties with creosote by the Rueping process, and this year we have started to treat all ties with a mixture treatment, which, in the territory supplied by our Somerville, Tex., plant, is 70 per cent creosote and 30 per cent petroleum oil, and in the territory supplied by our Albuquerque plant, which is in a much drier climate, is 50 per cent creosote and 50 per cent petroleum oil, leaving in about 7½ lb. of mixture to the cubic foot of timber. From extensive experiments carried on

since 1909, we are satisfied that the addition of the petroleum oil which has an asphaltic base adds considerable to the mechanical life of our ties.

All of our cross ties are inspected at the point of origin, and we have no reason to complain about the quality of the material. When the ties are received at the treating plant they are stacked for seasoning, as it is the practice on the Santa Fe to treat nothing but air-seasoned material.

When ready for treatment they are put through an adzing and boring machine which adzes a place for the tie plate, bores the holes for the spikes, and also cuts off about ¼ in. from each end of the tie. This machine then stamps on one end of the tie the kind of wood and weight of rail for which the tie is bored, and on the other end the kind of treatment and the year treated.

Cutting off the end of the tie really provides another inspection, as we sometimes find indications of rot after the cut which it would otherwise be impossible to detect, and these ties, of course, are culled. After the ties have been treated they are again stacked for about three months' seasoning before being shipped out. We place much importance on this feature, as we know that we get better results because of this practice.

When the ties are ready for shipment, they are ordered and distributed according to a plan which provides for certain species of woods to be used in definite localities for each class of track; and in every case, provides for hardwood ties being used on all curves of two degrees and upwards; softwood ties, such as native pine, Oregon fir, New Mexico pine and redwood, being used on tangents in the various districts to which they have been assigned. When the ties are inserted in the track the instructions are that each tie must have a tie plate, and these instructions are very carefully followed. The plate is 7½ in. by 9 in. and practically covers the face of the tie.

A dating nail is placed on every tie inserted; a round head nail for a treated tie and a square head nail for an untreated tie. This nail bears the year of insertion and is placed on the top of the tie about half way between the end and the rail base. In addition to providing a ready means of identification as to the year of insertion, I think the nail is of great value in other ways. A section foreman will invariably give a tie of comparatively short life a much closer inspection before taking it out of track than if there was no nail showing its age.

Commencing in 1904 we started to keep a record of all ties inserted in the track on all parts of the system and continued this until 1910, when we found that this did not work satisfactorily, so in 1910 an experimental section was established on each superintendent's division, the section selected being an average of the conditions on that territory.

These sections are carefully checked each year by representatives from the manager of treating plants' office and a report of this inspection is sent all the operating and maintenance of way officers concerned, as well as to the chief engineer, system and assistant chief engineer, system. In addition to this, we have several sections of track where ties have been laid out of face where we keep a close record of the life of the ties.

By these means we are able to keep a very accurate record of the life we are getting from our ties—a record of the ties inserted in regular practice of spotting in and also a record of the service given by ties inserted out of face.

In addition to the inspection of our experimental sections, we have inspectors with motor cars who inspect all released ties found on the right-of-way. They are accompanied by each roadmaster on his territory, and a report is made daily of the ties inspected, giving the year of insertion when possible, and the cause of removal. When these inspections were first started some years ago, we found quite a number of ties that should not have come out of the track, but now we find very few indeed on the right-of-way that should not have been removed from track; and this is entirely due to the intelligent and whole-hearted support of everybody concerned.

The question arises as to whether such an organization is profitable to the railroad, and I think of no better answer than the following, as I think the figures speak for themselves: In 1885 we treated 111,503 ties. From 1885 to 1922 we treated 70,499,756 ties. This, I think, demonstrates beyond all question that the management is satisfied that the treatment of material is an economical proposition.

As to the results—take one section of ties laid out of face near Melvern, Kans., on the Ottawa cutoff which carries possibly the heaviest traffic on the system. We inserted on this in 1906, 24,238 hewn Texas pine ties, treated with creosote by the Rueping process. Our annual inspection at the end of 1922 showed 833 ties removed, only 3 of them on account of rot, the balance being taken out on account of other causes. Thus the life given by these ties up to the end of 1922 was 15.97 years and the present appearance of these ties indicates an average life of at least 20 years.

In 1898, the Santa Fe System, then a line 8,185 miles, used 336 ties to the mile. In 1922, with 17,104 miles, it used 158 ties to the mile—less than half as many ties per mile used in renewals in 1922 as in 1898. The following table gives the total and average tie renewals for each year since

Year	Total miles	Total ties inserted for renewals	Total ties inserted per mile
1898	8,185	2,751,849	336
1899	9,028	2,246,250	249
1900	8,804	1,687,537	192
1901	9,368	1,557,866	166
1902	9,557	1,955,093	205
1903	9,768	2,352,502	241
1904	10,237	2,770,306	271
1905	10,885	2,788,378	256
1906	11,637	2,291,997	197
1907	11,694	3,365,017	288
1908	12,169	3,667,181	301
1909	12,601	3,691,623	293
1910	13,379	3,758,984	281
1911	13,889	3,781,745	272
1912	14,488	3,252,061	224
1913	14,766	2,863,839	194
1914	15,293	2,753,842	180
1915	15,409	3,234,760	210
1916	16,151	3,118,941	193
1917	16,276	2,483,651	153
1918	16,554	2,456,599	151
1919	16,711	2,302,952	139
1920	16,924	2,753,673	163
1921	16,933	2,514,325	148
1922	17,104	2,693,905	158

Discussion

The discussion of this paper centered around the objections to the adzing of ties after treatment, a number of members describing the measures which they have adopted to prevent the mutilation of the timber when canting the rail and otherwise changing the position of the tie.

The Education and Development of Track Foremen

The growing importance of economy in all branches of railroad work accentuates the need of education. Notwithstanding acute periodic shortages of track labor, track foremen are required and expected to meet changing conditions. This calls for better education, the benefits of which are:

First—The creation of loyalty. The importance of loyalty cannot be over-stressed. In time of storms or accidents, track foremen must necessarily take the initiative and lead their men into physical hardship, supported only by an appreciation of responsibility and duty. Disgruntled or disloyal men cannot be expected to render emergency service of this kind to the same degree as satisfied, loyal men.

Second—Sustaining interest. There are many artificial ways of creating interest in work, such as the offering of bonuses and introducing friendly competition. However, as a rule the interest created by these methods is short lived. Interest can be sustained more effectively through educational methods.

Third—Teaching men to think. No one will deny that a thoughtful man will accomplish more with the same expenditure of effort than a thoughtless one. To teach men to think is to teach them to arrange their ideas in logical sequence and to determine the correct values of the elements entering into every piece of work. Too frequently subordinate employees are placed at a disadvantage by their officers in the performance of work because they are not given the bentfit of discussion which would clarify many points in doubt and enable the subordinates to perform the work more readily and satisfactorily. To this end the committee recommends that officers cultivate tolerance and patience in dealing with subordinates and believes that this attitude will do much to further education through personal contact. Men should be made to feel that it is to their credit to develop their subordinates and that this is a factor by which their worth is judged.

Every possible influence should be used to bring about uniform track forces, based upon a fair minimum. Work which can be performed during the winter months should be carefully studied and conserved for that period. Comment is hardly needed upon the difficulty of educating and developing men when there is a high labor turnover. When the continuity of work is doubtful, the good men are the first to leave, for they know that they can secure continuous employment elsewhere and their intelligence and ambition, the very traits that make them valuable to the railroads, lead them to seek other employment.

Many railroads have already established adequate differentials between the rates paid their foremen and their laborers. The incentive afforded laborers to remain in railroad employ and develop themselves into capable foremen is greatly enhanced by sufficient differentials. This feature should receive careful consideration in connection with the development and education of men.

Laborers as Material for Foremen

Employment: The type of men employed frequently determines the extent to which they may be developed into foremen. In many industrial centers the track foremen have little opportunity to pick and choose. More often than not the number of men available is inadequate. This condition seems destined to continue. Because of this the committee feels that industrial centers are not a fertile field for the development of foremen. The solution offered is to attempt the more intensive education and development of laborers in agricultural and forested sections and to supply the industrial centers with foremen therefrom. It is appreciated that there are some lines which lie wholly within industrial sections and for whom this plan is not feasible. Such lines will have to make the best of the men they can develop and supply the deficit by recruiting men from other lines as is now being done to a large extent.

Apprentice Systems: Some roads have experimented with an apprentice system with indifferent success. Some failures can be attributed to abuse, others can be charged to lack of interest and effort on the part of officers. The committee feels that some practical apprenticeship system could be worked out and suggests the following scheme to be modified as conditions direct. Employ boys from 17 to 19 years of age with the usual minor's release. See that they have at least a common school education. Pay them two-thirds the laborer's rate the first year, the standard labor rate the second year, a differential of from 2 to 5 cents an hour the third year, and give them the title and pay of assistant foremen the fourth year. Boys who show no aptitude or interest in track work should not be encouraged to finish the apprenticeship, while those who do show these qualities should be encouraged and tutored, both by the foreman and supervisors. The first year should preferably be spent on an outlying section, the second year in an extra gang assigned to ballasting out of face, the third year in an extra gang laying rail and the fourth year in a terminal yard. Apprentices should be encouraged or perhaps assisted in taking a correspondence school course dealing with track work. They should be made entirely familiar with timekeeping, material records and the other clerical work devolving upon a foreman. Care should be exercised to see that no more apprentices were employed and developed than the road required to fill vacancies. This scheme would require close and interested supervision.

Rotation of Capable Men: Capable men interested in track work should be given ample opportunity to learn all of the various phases thereof. Too frequently capable and reliable men who were good timber for development have preferred to stay on outlying sections because their early experience has not embraced extra gang and yard work.

Recognition of Ability: Track foremen should be encouraged to turn their forces over to promising laborers occasionally in order to determine whether they have the requisite qualities for development into foremen. If they discover the necessary ability in these men they should continue to develop it until in their opinion the men are ready to qualify.

Personal Contact: The necessity for economy in the performance of work and the use of materials compels a closer supervision which has not only developed a closer relationship and understanding between supervisors and foremen but has also expedited the development of the foreman.

Magazines: Many roads have already adopted the practice of subscribing to magazines devoted to track and maintenance work for their foremen. The committee strongly endorses and believes individual subscriptions are amply justified in order that foremen may refer to back numbers when occasion demands. Supervisors should discuss interesting articles with their foremen in order to determine whether the magazines are being read and also in order that the greatest benefit will be derived from such articles.

Correspondence School Courses for Foremen: When any foreman shows a disposition to improve himself by taking a correspondence school course dealing with his work he deserves encouragement. There are doubtless many foremen who are not aware that courses dealing with track work are obtainable and a supervisor interested in the development of his men should see to it that his progressive foreman, if not all of his foremen, know of the opportunity.

Association for Foremen: Your committee has been kept in close touch with the Kansas City Southern Maintenance of Way Association and believes it a medium of development and education of sufficient merit to warrant its application on other roads.

Conclusions

The committee presented the following conclusions:

1. That the need for and benefit to be derived from education as a means of developing men should be recognized and every advantage taken of educational methods.
2. That education creates and sustains both loyalty and interest and promotes economy.
3. That superior officers should be made to feel that it is their duty and to their credit to develop subordinates.
4. That every influence should be employed to stabilize the size of track forces in the interest of attracting better men for education and development.
5. That adequate and deserved differentials between labor rates and foremen's rates be established or re-established as an incentive for good men to look forward to and await promotion.
6. That apprenticeship systems merit study and consideration.

7. That the rotation of men through the various phases of track work to broaden their knowledge is desirable.

8. That foremen should be impressed with the important part they have in discovering good men and urged to respond to the obligation.

9. That supervisors should realize the possibilities of personal contact with their men and cultivate patience and tolerance in order to reap the greatest benefit therefrom.

10. That subscriptions to magazines for foremen by the railroad is a good investment.

11. That correspondence school courses for progressive foremen are of great benefit, both to the man and his company.

12. That associations for foremen if properly organized and maintained are amply justified by the many benefits derived therefrom.

S. E. Shoup, assistant to general manager, Kansas City, Southern, Kansas City, Mo., chairman.

Discussion

Discussion of this report centered largely around the extent to which the roads are justified in maintaining more than the minimum section force. Some contended that a larger force was not warranted, while others maintained that a careful survey of the year's maintenance work would show much that could be done during the winter without disadvantage.

Report on Maintenance Standards for Light Traffic Branch Lines

For the purpose of this discussion branch lines are designated as A, B, and C, according to the volume of traffic.

Class A Branch Lines.—Class A branch lines include those with from 7 to 10 freight trains and 4 to 6 passenger trains a day, the freight trains operating at speed of 30 to 35 miles and passenger trains at 40 to 45 miles per hour. Class A lines have no limits as to weight of motive power, or cars handled.

Lines of this type should be laid, where possible, with new 90-lb. rail; or if this is not obtainable, with good selected second hand 90-lb. rail sawed or rerolled. New angle bars should be used when laying this type of rail because of the marked saving in the expense of maintaining the track after the rail is laid. These should have 20 first-class treated ties under a 33-ft. rail and if they are of soft wood they should be tie-plated. No less than 8 to 10 in. of ballast should be used. On descending grades where the rail creeps, a sufficient number of rail anchors should be applied to hold the rail and thereby avoid the unnecessary expense of spacing the ties under the joints each year.

The turnouts and sidings should be laid with the same weight of rail as the frogs, switches and guard rails and they should be equipped with the proper braces and fastenings so that they will stay in place. All guard rails should be fastened to the running rails with heel blocks and clamps. This class of line should have at least six men per section during the summer with sections not to exceed six miles in length.

Class B Branch Lines.—Class B branch lines include those handling heavy loads in three or four freight trains in addition to two passenger trains and two locals each way daily. A line of this character should be laid with good second-hand 80-lb. or 85-lb. rail. It should have at least 8 in. of gravel ballast under the ties and at least 20 ties to the 33-ft. rail. If soft wood ties are used all ties on curves should be tie-plated with new or second hand tie plates. Where traffic on such lines is in one direction, rail anchors should be applied to keep the rails from creeping.

Class C Branch Lines.—Class C lines include those carrying very light power in two passenger trains, two local trains and possibly a pick-up train a day. Such lines should be laid with relay 80-lb. rail to reduce maintenance costs and avoid derailments. We should not overlook the fact that the railroads are constantly placing heavier power and equipment on their main lines and transferring their lighter equipment to branch lines and that track maintenance is not keeping pace with these changes. A road will send a car over the branch line whether it weighs 20 tons or 70 tons, and it oftentimes weighs more than the locomotive hauling it. It is the heavily loaded cars that are causing the track to become rough and go out of line because of light rails and poor ballast.

Passing tracks on branch lines should be laid with the same type of rail as the main line and should be ballasted with cinders, where possible, to reduce maintenance costs. Sections on Class C branch lines should not be over eight miles long and should be equipped with motor cars. On all branch lines ditching should be done with a mechanical ditching device and where this cannot be done, teams with scrapers should be used to clean out ditches and shape them for the winter.

W. F. Muff, roadmaster, Atchison, Topeka & Santa Fe, Newton, Kans., is chairman of the committee.

Report on Labor Saving Devices

It can be truthfully said of men in the maintenance of way department that since the time railroads were first built, it has been their principal effort to get the most work done at the least expense. But at the present time, when the old type of track man is gone and the number of such as we can get is insufficient, we must turn to mechanical methods to accomplish our work.

While machinery is not always economical, the fact that work can be done with less manual labor makes the use of those devices imperative.

Lifting Machinery

The ordinary steam crane requires less men, reduces hazard and saves time. It will handle frogs, switches, guard rails and heavy switch timbers, will load and unload rails and should be more generally used for lifting in new rail and lifting out the old, when rails are being renewed. Among the newer devices that are rapidly being applied to cranes are magnets by which scrap, tie plates, angle bars, etc., can be picked up quickly and at minimum cost. Clam shell buckets are now used to load cinders, clean ballast, and do various other kinds of work. Air hoists of many different designs are used for rail laying, and for loading and unloading material, the day having gone by when this work can be done by hand-driven machines.

Earth Moving Machinery

Would anyone care to go back to the days when we had to organize a gang of 35 men with rubber boots, picks, shovels, an engine and a train crew with flat cars to do ditching, when such equipment as roadbed spreaders and ditching machines is available? The new feature of the spreader is a ditching wing. For the same purpose the hoisting ditcher is adapted to slope a bank at any angle, cut to any depth and load the material excavated on cars backing long the top of the cars as they are loaded.

Ballast Machinery

Where ballast becomes so foul from cinders, sparks and dust that it becomes necessary to move and clean it, a method has been developed that makes use of large screens placed on a ballast car, with a hoist to pick up the ballast and drop it on the screen, the dirt falling in the car and the clean ballast going back between the tracks. Next in favor is the power-operated ballast screen, which consists of a belt conveyor and revolving screen driven by a gasoline engine. Stone to be cleaned must first be shoveled out from between the ties, and then shoveled into a long trough through which a belt is operated, conveying the stone to the revolving screen. The force to operate this device in an efficient manner depends on local conditions, the following being found to be the most efficient, with which about 96 ft. of track can be cleaned per hour.

1—foreman.
10—men shoveling out in advance of the machine.
7—men placing the stone in the machine, three on the outside shoulder and four in the space between tracks.
1—man disposing of the dirt at the seven-foot line.
1—assistant foremen in charge of the machine and operating the stone chute.
1—machine operator.
1—flagman.

If the delay from traffic does not exceed 25 per cent of the actual time worked, the cost is about 15 cents per lineal foot of track cleaned or 45 cents per cubic yard of stone ballast.

For the tamping of ballast under ties, the pneumatic tie tamper is an acknowledged help in this class of work. Improvements are now being made in the compressor plant supplied with these tampers. A more perfectly balanced machine of lighter construction will greatly improve the results obtained with this equipment. Track drills, devices for turning nuts on track bolts, equipment to bore ties and timber and cutting and chipping tools are now available with these machines and are comparatively inexpensive, considering the savings that can be effected by their use. A mile of badly corroded nuts on track bolts can be cut off in four hours with two pneumatic rivet cutters, which work would require at least 12 men with chisels and sledges.

Track Lining Devices

The latest feature of track work to receive attention is the lining of track. At least two devices are available to throw track with less than one-half the men otherwise required. These devices will require some improvement to guard against lifting the track while lining it, for otherwise the expensive operation of surfacing the track will be thrown away.

A. M. Clough, supervisor, New York Central, Batavia, N. Y., is chairman of the committee.

Other Papers

R. L. Cochrane, engineering department, Atchison, Topeka & Sante Fe, Chicago, presented a paper on the maintenance of joints in which he referred to the failure of track construction to keep pace with traffic. On the Santa Fe the percentage of rail failures which have occurred within the limits of the joints has ranged from 12.8 per cent in 1921 to 3.4 per cent for the first eight months of 1923. A recent canvass on this road showed that the life of joint ties was approximately 70 per cent of that of intermediate ties. These figures indicate the necessity of giving more attention to the design and maintenance of joints. Mr. Cochrane then discussed the relations which the various units of the joint bear to its strength and showed the necessity for bolts of proper strength kept continuously and uniformly tight by spring washers or nut lock.

Americanization

Col. F. G. Jonah, assistant to the president and chief engineer of the St. Louis-San Francisco, addressed the convention on Wednesday morning. He paid a tribute to the roadmasters of the generation now passing who went to work with little or no equipment and with track of light construction. He emphasized the fact that our railways have been built and maintained largely with labor that has immigrated from foreign countries. Thus years ago they came from the British Isles, Germany and the Scandinavian countries, but today the roadmaster is required to deal with a different class of men, including the immigrant from eastern and southern Europe. The roadmaster can render a real service to our country by assisting these men to become American citizens. As these men enter railway service the roadmaster can outline for them the fundamental principles of citizenship and impress on them the fact that this is a land of equal opportunity in which they and their children can develop.

Other Features

At a session on Tuesday evening, B. O. Johnson, assistant to the operating vice-president of the Northern Pacific and for five years in charge of the railways of Siberia for the Inter-Allied Commission, presented an interesting description of the Russian railways and their methods of operation.

A valuable and instructive feature of the week's activities was an inspection of the mills of the Inland Steel Company at Indiana Harbor, Ind., via a special train over the New York Central. The tour through the plant covered an inspection of the operations incident to the manufacture of rails, angle bars, tie plates, bolts, nuts and spikes, thus giving the roadmasters a practical insight into the processes of making some of the basic materials with which they deal in their every day work.

The Track Supply Exhibit

A total of 61 firms participated in the exhibit of the Track Supply Association on the mezzanine floor immediately below the convention hall. The officers of this association are as follows: President, F. M. Condit (Fairbanks, Morse & Co., Chicago); vice-president, J. J. Cozzens (Union Switch & Signal Company, New York City); secretary-treasurer, W. C. Kidd (Ramapo-Ajax Corporation, Hillburn, N. Y.); director ex-officio, Herbert T. Potter (vice-president, Wyoming Shovel Works, Wyoming, Pa.); advisory directors, E. T. Howson (western editor, *Railway Age*, Chicago), and R. A. Van Houten (vice-president, Sellers Manufacturing Company, Chicago); directors, Alex Chapman (western sales manager, Rail Joint Company, Chicago); A. H. Told (general manager, Positive Rail Anchor Company, Marion, Ind.); K. J. Eklund (vice-president, Mudge & Company, Chicago), and J. Howard Horn (sales manager, National Lock Washer Company, Newark, N. J.).

The list of firms exhibiting, with the names of their representatives and the character of their exhibits, follows:

Air Reduction Sales Company, New York; oxygen, acetylene and carbide cutting and welding apparatus, radiograph and regulators; B. N. Low, R. T. Peabody, C. A. Daly and F. Graneman.

American Chain Company, Bridgeport, Conn.; rail clamps, brace plates, replacers, rail benders, one-piece guard rail, compromise joints; J. J. O'Connell.

American Hoist & Derrick Company, St. Paul, Minn.; photographs of ditchers; Miss H. Holer and C. Hook.

American Steel & Wire Company, Chicago; woven wire fence, steel fence posts and galvanized steel fence posts; L. P. Shanahan, N. E. Evans, J. W. Collins, A. W. Froude, J. W. Patterson, J. W. Meaker and A. L. Waterman.

American Valve & Meter Company, Cincinnati, Ohio; switch stands and track appliances; J. T. McGarry, F. C. Anderson and Dan J. Higgins.

Balkwill Manganese Crossing Company, Cleveland, Ohio; model of an articulated manganese steel crossing; S. Balkwill.

Bethlehem Steel Company, Bethlehem, Pa.; switch stands, guard rail, gage rods; Neil E. Salsich, E. H. Gumbart, J. F. Hennessey, G. Riddle, J. S. Clark, J. H. Richards, C. A. Alden, J. C. Chandler and J. V. Honeycutt.

Blake Manufacturing Company, Mansfield, Ohio.—Portable flood light, soldering irons. B. W. Leonard and H. W. Armstrong.

Buda Company, Chicago; section motor cars, switch stands, tool grinders, track liner, track drill, track jack; J. E. Murray, F. T. Connor, A. L. Bliss, H. C. Beebe, J. L. Artmaier and E. Conant.

Carbic Manufacturing Company, Duluth, Minn.; carbic lights, acetylene welding and cutting apparatus; A. D. Guthrie and F. G. Squire.

Chicago Malleable Castings Company, Chicago; rail anchor tie plate, tie plate with key, rail anchor tie plate with key, rail clips, bumping posts and literature; Warren Osborn.

Chipman Chemical Engineering Company, New York; photos of track; M. McComb and B. G. Thompson.

Creepcheck Company, Inc., New York; creep checks; A. J. Dinklage, P. E. Brown, F. Ragan and T. J. Farrell.

Crerar, Adams & Co., Chicago; bonding drill, track drill, rail saw, die starter, jacks, shovels, etc.; Russell Wallace, W. I. Clock, J. A. Martin and W. Reidell.

Duff Manufacturing Company, Pittsburgh, Pa.; jacks; C. N. Thulin and E. E. Thulin.

Electric Tamper & Equipment Company, Chicago; photos of electric tie tamping machine; C. Jackson, W. Adams, H. W. Cutchall and V. Cartier.

Elliot Frog & Switch Company, East St. Louis, Ill.; adjustable switch brace, guard rail clamp, adjustable clips, switch stand; H. J. Elliot.

Fairbanks, Morse & Co., Chicago; inspection car; E. C. Golladay, F. J. Lee, F. M. Condit, G. W. Lewis, H. L. Hillary, D. K. Lee, J. L. Jones, E. E. Pendray, E. P. Chase, H. E. Vogel, C. G. Mahana, W. C. Dehn, B. S. Spaulding, C. B. O'Neill and P. H. Gilleland.

Fairmont Railway Motors, Inc., Fairmont, Minn.; light inspection car; W. F. Kasper, W. D. Brooks, S. D. Gibson and M. A. Evans.

Fleming & Son Company, J. R., Inc.; Scranton, Pa.; switch point protector; A. J. Fleming.

Hauck Manufacturing Company, New York; thawing outfits, kerosene torches, circular flame burners, venturi burners; W. C. Squire and C. P. Cogswell.

Hayes Track Appliance Company, Richmond, Ind.; derail and model; H. J. Mayer, S. W. Hayes and H. Q. Hamilton.

Headley Good Roads Company, Philadelphia, Pa.—Samples of bituminous material for road crossings, photographs. F. X. Kern and W. T. Gilbert.

Idol Track Liner Company, Chicago; track liners; T. D. Crowley, F. R. Sinning and Mr. Franzen.

Indiana Piston Ring Company, Hagerstown, Ind.; light weight motor car, peddle car; Macy O. Teetor.

Ingersoll-Rand Company, New York; pneumatic tie tamper, pneumatic rail drill, pneumatic nutting machine, pneumatic shovel and pneumatic bonding drill; W. H. Armstrong, J. N. Thorp, Jr., and Charles Dougherty.

Jordan Company, O. F.; East Chicago, Ind.; moving pictures; A. L. Greenabaum, J. S. Zuckerman and J. W. Bauton.

Kalamazoo Railway Supply Company, Kalamazoo, Mich.; motor car, track jacks, combination track gage and level; John McKinnon, F. E. McAllister and H. R. Miller.

Lundie Engineering Corporation, New York; tie plates, rail anchors; W. Brooke Moore, L. B. Armstrong and E. Brandeis.

Maintenance Equipment Company, Chicago; friction car stop, steel fence post, blue flag derail, photo of rail layer and photo of power ballast screen, switch point straightener, tie spacer; H. C. Holloway, J. A. Roche, E. Overmier and A. L. Arnold.

Mechanical Manufacturing Company, Chicago; all-metal bumping post; H. E. Johnson.

Morden Frog & Crossing Company, Chicago; rail, braces, switch connections; S. S. Withrow, W. J. Gilbert, A. C. Smith and H. H. Hartz.

Mudge & Co., Chicago.—Motor car engine. Karl J. Eklund, J. M. Mulholand and J. K. Vanatta.

National Lock Washer Company, Newark, N. J.; spring washers and lock washers; J. Howard Horn, R. L. Cairncross and Stanley H. Smith.

National Malleable Castings Company, Cleveland, Ohio; model of wrecking hook, malleable iron washers, rail braces and tie plates; E. V. Sihler, T. Aishton, G. Faitz and R. Wright.

Northwestern Motor Company, Eau Claire, Wis.; literature and photos; A. H. Nelson.

Oxweld Railroad Service Company, Chicago; oxy-acetylene welding and cutting equipment; W. H. Kofmehl, L. C. Ryan, F. C. Teichen, Fred Lurquin and H. R. Wehner.

P. & M. Company, Chicago; anti-creepers; S. M. Clancy, D. T. Hallberg, John Gallagher, Max Ruppert and J. E. Mahoney.

Pocket List of Railroad Officials, New York; copies of publication; J. Alexander Brown and Harold A. Brown.

Positive Rail Anchor Company, Marion, Ind.; girder type guard rail, rail anchors, rail braces, guard rail plates and braces and tie plates; A. H. Told and L. C. Ferguson.

Q & C Company, New York; one piece guard rail, guard rail clamp, compromise joint, derails, steel fence post, car replacer; R. J. McComb, J. L. Terry and Lewis Thomas.

Rail Joint Company, New York; insulated joints, compromise joints, standard joints and track liner; Charles Jenkinson, R. W. Payne, Alex Chapman, G. T. Williard, C. B. Griffin, J. N. Meade, W. E. Gadd, Milton Markley, E. A. Condit, G. H. Larson, V. C. Armstrong, C. A. Disbrow and T. Ryan.

Railroad Supply Company, Chicago; tie plates; E. H. Bell, H. G. Van Nostrand, W. S. Boyce, A. H. Smith and J. C. Durancean.

Railway Purchases and Stores, Chicago; copies of publication; Edward Wray and J. P. Murphy, Jr.

Railway Review, Chicago; copies of publication; C. H. Gertner, D. T. Stillman, G. E. Boyd and L. R. Wolf.

Ramapo Ajax Corporation, Hillburn, N. Y.; automatic switch stand, double shoulder switch plate, manganese guard rail, guard rail clamp, adjustable rail brace, forged braces; J. B. Strong, W. C. Kidd, R. J. Davidson, Jr.; D. F. Hilton, T. E. Akers, P. Hoffman, John V. Houston and G. A. Carlson.

Reade Manufacturing Company, Jersey City, N. J.; model of chemical weed killing machine; C. H. Reade, R. H. Bogle and R. W. Pritchard.

Reliance Manufacturing Company, Massillon, Ohio; nut locks; H. J. McGinn, E. C. Gross, D. L. Robertson and H. R. Hanna.

Safety Guard Rail Lock Company, Orlando, Fla.; safety guard rail lock; H. L. Earle and W. L. Daughtry.

Selflock Nut & Bolt Company, East Syracuse, N. Y.; track bolts with lock nuts; M. E. Jennings.

Sellers Manufacturing Company, Chicago; wrought iron tie plates; G. N. Hogan, R. A. Van Houton and R. J. Platt.

Simmons-Boardman Publishing Company, New York; copies of *Railway Age*, Railway Engineering and Maintenance, Maintenance of Way Cyclopedia and Roadway and Track; L. B. Sherman, E. T. Howson, W. S. Lacher, F. C. Koch, B. J. Wilson, D. A. Steel, J. P. O'Hern and W. F. Rench.

Stevens Metal Products Company, Niles, Ohio; galvanized fence posts, steel barrels; Stanley H. Smith, George J. Purcel and E. D. Thompson.

Templeton, Kenly & Co., Ltd., Chicago; track jacks, car jacks, pole jacks and emergency jacks; J. L. Crowley and G. L. Meyer.

Union Switch & Signal Company, Swissvale, Pa.; insulated rail joints; J. J. Cozzens.

Van Dresar, E. L., St. Paul, Minn.; tie plates, E. L. Van Dresar.

Verona Tool Works, Pittsburgh, Pa.; track tools, nut locks, track jacks, rail joint springs; E. Woodings, J. S. Wincrantz and W. F. Hart.

Warren Tool & Forge Company, Warren, Ohio; adzes, clawbars, lining bars, picks, spike mauls, sledges, hammers, track chisels, wrenches; H. C. Mull, George F. Konold, M. J. Konold and J. D. Robertson.

Wm. Wharton, Jr., & Co., Inc., Easton, Pa.; insulated gage rod, photograph of manganese frog, gas cylinders; Victor Angerer, H. F. Heyl, H. F. McDermott and F. H. Lehecka.

Woolery Machine Company, Minneapolis, Minn.—Motor car engines, section motor car. H. F. Woolery and C. E. Berk.

Wyoming Shovel Works, Wyoming, Pa.; track shovels, spades, scoops, scuffle hoes and picks; H. T. Potter, Stanley H. Smith, G. E. Geer and E. L. Ruby.

NON-EXHIBITING MEMBERS

Cleveland Frog & Crossing Company, Cleveland, Ohio.
The Frog, Switch & Manufacturing Company, Carlisle, Pa.
Pettibone-Mulliken Company, Chicago.
St. Louis Frog & Switch Company, St. Louis, Mo.

At the annual meeting of the Track Supply Association on Wednesday, the following officers were elected for the ensuing year: President, J. J. Cozzens, Union Switch & Signal Company, New York; first vice-president, A. H. Told, Positive Rail Anchor Company, Marion, Ind.; secretary and treasurer, W. C. Kidd, Ramapo-Ajax Corporation, Hillburn, N. Y.; directors for one year, Alexander Chapman, Rail Joint Company, Chicago; and K. J. Eklund, Mudge & Co., Chicago; directors for two years, L. C. Ryan, Oxweld Railroad Service Company, New York, and J. Howard Horn, National Lock Washer Company, Newark, N. J.

Progress on Transportation Program

WASHINGTON, D. C.

VERY SATISFACTORY PROGRESS made by the railroads on the "program to provide adequate transportation" adopted at meetings of the American Railway Association and of the Association of Railway Executives on April 5 is shown by the fifth monthly progress statement issued by the Car Service Division of the American Railway Association. One of the most important features of the program was the resolution to reduce the number of locomotives in need of heavy repairs to 15 per cent by October 1. This objective was obtained by September 1, when the number of locomotives in need of heavy repair was 9,392, or 14.7 per cent of the number on line. This was the smallest number of locomotives in need of heavy repairs since August 1, 1920, when the Car Service Division began the compilation of these reports. This also represented a decrease of 1,095 as compared with August 15. There were also on September 1, 1,125 locomotives, or 1.8 per cent, in need of light repairs. The number of locomotives turned out of shop during the last half of August, 23,056, also established a new record for a similar period and on September 1 the railroads had 53,438 serviceable locomotives and 2,714 in storage.

The objective as to freight car repairs had not yet been obtained on September 1, but the number of cars in need of repair was less than on any date since November, 1920. The total was 175,327, or 7.7 per cent, a decrease of 13,308 cars since August 15. Six per cent of the freight cars were in need of heavy repairs, while 1.7 per cent were in need of light repairs. On January 1 the number of locomotives in need of heavy repairs was 21.1 per cent and the number of freight cars in need of heavy repairs was 7.2 per cent, and of all freight cars in need of repairs, 9.5 per cent.

The total number of cars of revenue freight loaded during the 35 weeks of this year to September 1 shows an increase of 3 per cent as compared with the estimate made in April, besides being far in excess of the total for the corresponding period of any previous year. The loading of 1,092,567 cars for the week ended September 1 was the largest on record.

The following shows the cumulative loading by commodities for the 35 weeks of 1923 compared with the corresponding period of previous years:

	1923	1922	1921	1920
Grain and grain products.	1,454,744	1,577,616	1,514,379	1,205,297
Live stock	1,119,840	998,865	861,223	1,011,677
Coal	6,499,704	4,227,883	5,224,289	6,490,727
Coke	515,177	297,874	210,644	401,315
Forest products	2,563,825	1,922,322	1,673,319	2,138,232
Ore	1,587,445	1,009,941	647,014	1,529,600
Mdse. L.C.L. and misc.	19,421,008	17,573,200	15,523,703	17,136,744
Total	33,161,743	27,607,701	25,754,571	29,913,592

From January 1 to September 1, 116,117 new freight cars had been put in service, including 19,167 in August, and 72,906 were on order on September 1. Also, 2,583 new locomotives had been put in service, including 362 in August and 1,517 were on order.

The railroads had also resolved to complete the storage of fuel to as great an extent as possible by September 1 and on that date the total railroad coal in storage amounted to 16,365,993 tons as compared with 14,098,776 on August 1 and 6,756,886 on January 1. On September 1 there were 2,276,043 tons in cars and 14,089,650 tons in stock piles.

The latest figures for the average carload and average miles per car per day are for the month of July. The average tons per loaded car for July was 28.5 as compared with 25 in July, 1922, and 27½ in July, 1921, while the average miles per car per day was 27.9 for July as compared with 20.9 in July, 1922, and 21.6 in July, 1921. The average for July represented a slight decrease as compared with the three preceding months while the average carload has shown a slight increase each month since April 1.

Essentials of Division Accounting*

By Colonel Charles Hine

DIVISION ACCOUNTING on American railways means the assembling at the headquarters offices and the allocation there to prescribed classifications of the figures covering the costs of operation on that portion of the railroad's mileage designated as one of the operating divisions into which for operating, including maintenance, purposes all sizable railways are now segregated.

Definition is necessary because the term division accounting has been somewhat loosely used. A shop accountant having charge of the accounts of a general shop, independent of any particular operating division, is sometimes incorrectly termed a division accountant. A bureau of miscellaneous accounts, such as telegraph and dining cars, although concerning several operating divisions, has been erroneously called a division accounting office. The mistake has been in attempting to make the specific term, "division," meet the generic requirement of all accounting offices not covering the road as a whole. The remedy is to confine "division" to its specific use and employ when appropriate such other specific terms as "shop," "local," etc., etc.

The number of persons in a division accounting office varies of course with the mileage and traffic density of the division but is typically from 15 to 25. The operating accounts kept in a division accounting office fall under four principal heads: (1) Maintenance of way and structures. (2) Maintenance of equipment. (3) Transportation expenses. (4) Fuel, material, and supplies, received, charged out, and on hand. The classification accounts under the first three heads are prescribed by the Interstate Commerce Commission. Items charged out from the fourth head are distributed to the appropriate accounts under the first three heads. For capital account prescribed valuation segregations are made of appropriate items covering replacement and new construction.

As railways increased in size operating divisions were created and division superintendents and other division officials were held responsible for operating results. What these results might be was left for the auditor to interpret from accounts still kept by him in only one general accounting office. The auditor felt that his work was so different from that of the operating man that it would be wiser and cheaper to continue to keep all the accounts at one place under his own eye.

This view is still maintained on some well managed and successful roads—notably the Great Northern and the Burlington in the West; the Southern and the Atlantic Coast Line in the South.

No Alibi of Mistaken Distribution

The other view which is gaining ground year by year is to establish an accounting division co-extensive with the operating division. Three objects are sought, first, prompter tabulations and summaries; second, decreased correspondence occasioned by real or supposed errors in primary data; and, third, so to minimize the probability of expenditures being charged to the wrong division, that division officials responsible will concentrate effort on improving conditions reflected by the accounts rather than in alleging an alibi of mistaken distribution.

Some proponents of division accounting claim that such accounting costs no more to conduct than does centralized accounting. Others feel that division accounting is slightly more expensive but is worth the added cost because the increase is more than absorbed by the savings incident to more thorough divisional control of expenditures. Roads which omit division accounting have a partial equivalent in statisticians or statistical clerks in division offices. This item of expense should be considered in all comparisons of costs between division accounting and centralized accounting systems.

The prime justification for division accounting is the increased facility with which certain division officials can be held definitely responsible for prescribed expenditures actually under their control. This necessity becomes the greater as human undertakings become more complex in the ramifications of modern life. For that reason the division should first report only those items which have been charged out as purely divisional. To avoid confusion there should not be added until the next stage of completion those items of common or overhead expense which must, of course, be prorated to each division by the superior authority necessarily resident in a proper general office. Failure to emphasize this distinction frequently detracts from the full value of division accounting because of breeding those same wasteful arguments and attempted alibis which division accounting was created to eliminate.

Another inconsistency which some roads have not yet

*An address delivered before the annual service convention of the Tabulating Machine Company, Binghamton, N. Y., September 12, 1923.

learned to avoid is to attempt to have the same division accountant handle more than one division. This vitiates the principle of division accounting and in effect sets up a branch of the general office rather than a real division accounting office.

A pioneer in division accounting is the Southern Pacific, long known for the promptness, fullness and clearness of its monthly and annual reports as well as for its efficiency in operation. A dozen years ago it moved its division officers, including the division storekeeper, to the division superintendent's building so that the division accountant could keep all the accounts, including the division storekeeper's material accounts, for whose corresponding expenditures the respective division officers are responsible.

Headquarters Offices

Division accounting has been handicapped on some roads by lack of headquarters offices suitable for housing all official and clerical forces. Scattered locations preclude maximum use of business machines of various types to offset steadily increasing clerical wage scales. Here again introduces itself the immutable law of volume as warrant for differentiating from hand to machine function.

Few division headquarters offices in the country have been scientifically designed and constructed to meet the composite needs of modern organization and administration. Under the law of supply and demand such development can be reasonably expected in order to help meet the mounting costs of operation. In the meantime much can be accomplished by studies of existing methods and facilities by fresh minds separating reason from prejudice and fact from fancy.

A road having adopted a policy of division accounting and having selected competent division accountants is confronted with the question of determining whether the division superintendent or the auditor of disbursements shall be the immediate superior of the division accountant.

Division Accountant Immediately Under Superintendent

The Southern Pacific, Rock Island and Northern Pacific are notable examples of placing the division accountant immediately under the division superintendent. The obvious temptation of the superintendent to order his accounts fudged to make a favorable showing is guarded against by the development of standards of honor and by periodic audit at division headquarters by experienced traveling accountants, presumably of the caliber of national bank examiners. The proponents of this plan, of whom the speaker is one, believe that it would be just as consistent to remove the comptroller or chief accounting officer from the jurisdiction of the president as to say that the superintendent as local manager is inherently disqualified to direct an accountant. The system of accounting is uniform and prescribed by the Interstate Commerce Commission, which in turn would not relish having its own accountants report independently and directly to the president or to congress.

It is true that to make this plan a complete success the superintendent must have some previous knowledge of accounts and must be made to realize that every official appointment and promotion he may receive has depended upon a certificate of fitness from the chief accounting officer and the chief traffic officer as well as from the chief operating officer. War acquired knowledge of the principles of developing personnel is proving valuable to corporations.

Roads which place the division accountant directly under the auditor of disbursements include among others the Seaboard Air Line and the New Haven.

The Pennsylvania System carries the division accountant as an accounting department officer assigned to duty for the time being on the staff of the division superintendent.

The case for division accounting rests upon the argument that accounting as a dependent or secondary function must adjust its own convenience and activity to the fundamental or primary function of producing ton-miles and passenger-miles known as operation. As the operating division is a natural fundamental unit based upon the man-day, it follows that the accounting division must conform to the operating division. This conformity does not necessarily include a distinctly separate question, namely, that of official jurisdiction over the division accountant.

Functions of Accounting and Auditing

The confusion of thought on this important subject flows primarily from the initial mistake of corporations of attempting to combine in one department the two heterogeneous functions of accounting and of auditing. The one, accounting, is a component of the major function of conducting an operation, whatever that operation may happen to be—running a grocery store, managing a sales department, directing a traffic department, or handling a production or operating department. The other, auditing, is a component of the major function of review which latter should include physical inspection of performance as well as audit of accounts. Such comprehensive review, including final audit after payment, should be independent of any department and of any operating division, and be responsible to the executive department alone.

Division Disbursement

A corollary of division accounting is division disbursement. Nearly 20 years ago the speaker, pointing out through the *Railway Age* that the sending of division pay rolls to the auditor of disbursements for so-called audit is a perfunctory and useless procedure, advocated division payment before central audit. It is gratifying to find that for three years not only has the Seaboard Air Line been leading the country in comprehensive division accounting and in the division use of machines, but pays off through division offices and makes central audit after payment.

Perhaps patience rather than wisdom is the first essential of a prophet. Be that as it may the prediction is ventured that the next 20 years will witness much faster progress toward simplification. Society is doing its best to keep up with the engineer and the inventor. The sociologist can not and will not be hampered by the artificial, unscientific restraints of the accountant and the bursar. Division disbursement and system audit may be the first step. Sooner or later will come agency disbursement and qualified individual disbursement with division audit. (See "Future Company Accounting and Disbursement," *Railway Age*, May 5, 1923).

It is true that such expedited disbursement means in some cases a decrease in interest earned on current funds. Whether this can be given a trading value in the wage negotiations of collective bargaining would seem to depend mainly upon the vision and alertness of corporation managers.

Formerly corporations paid off once a month and from 20 to 30 days after the close of a month, by which time 50 or more days had elapsed since the first day's pay was earned. So needlessly involved are the processes of making and paying rolls that corporations dread as expensive and oppose as undesirable all legislation requiring more frequent pay days. Labor first secured the semi-monthly pay day and is now demanding the weekly pay day, which in New England it has already obtained.

It behooves corporations to progress to a tenable position of constructive aggressiveness. Every intelligent, English writing employee of prescribed probationary service should be induced through self interest to help in accounting and disbursement work. The composite effect should be reduced expenses. Payment must be made as safe and routine an incident of the day as knocking off work or making a department store purchase.

Telegraph Men Convene at Colorado Springs

Ways of Expediting Message Traffic, Training Employees and Developing Radio Were Discussed

THE TELEGRAPH AND TELEPHONE SECTION of the American Railway Association held its annual convention at "The Antlers," Colorado Springs, Colo., September 18, 19, and 20. Chairman R. F. Finley (N. Y. C. Lines West) presided. There were present 210 members, affiliated members and guests. Nine of the regular committees submitted extensive reports, two of which included several sub-committee reports. Three papers were also presented.

E. E. Jackson, secretary of the Chamber of Commerce of Colorado Springs, welcomed to Colorado those attending the convention, after which A. B. Cowen, general manager of the Mountain division of the Western Union, addressed the meeting on the work being accomplished by the Section. P. W. Drew, formerly secretary of the organization for 30 years, told of some of the early work done by the association.

The Committee of Direction, in its report at the opening session, announced the appointment of a special committee on telegraph and telephone mileage statistics to report on a plan or changes desirable in the Interstate Commerce Commission forms, so that those whose duty it is to supply this information will be able to understand and intelligently give the data desired, and thus eliminate various inconsistencies which have existed in past reports. The committee further reported that on the recommendation of the Engineering Division, R. H. Aishton, president of the American Railway Association, approved the formation of a joint committee on electric traction, to be composed of representatives from the Operating Division, Mechanical Division, Construction and Maintenance Section, Electrical Section, Signal Section and Telegraph and Telephone Section.

Two papers were presented at the Wednesday session. W. P. Elstrun of the American Telegraph & Telephone Company talked on "Accident Prevention and Allied Work in the Bell System." Recent Developments in Telephone Equipment for Train Despatching Circuits," was the subject of a paper presented by W. H. Capen of the western Electric Company. At the Thursday morning session a paper entitled, "Recent Progress in Long Distance Telephone Transmission" was presented by H. S. Osborne, transmission engineer, American Telegraph & Telephone Company.

A successful test of radio reception on a moving train was made on September 15 and 16 on Rock Island Rocky Mountain Limited, No. 7, from Chicago to Colorado Springs. Through the courtesy of E. V. Adams and W. H. Capen of the Western Electric Company, in co-operation with G. D. Hood, superintendent of telegraph of the Rock Island, a set was installed in one of the Pullmans carrying a number of the delegates to the meeting. Special programs were broadcasted from certain stations to test distance and clearness of reception. Three broadcasting stations in Chicago were picked up. Other stations heard clearly were Davenport, Iowa; Minneapolis, Minn.; Omaha, Nebr.; Kansas City, Mo.; and Memphis, Tenn.

Outside Plant Construction and Maintenance

The specification for wood pole lines has now been completed in accordance with the general outline prepared last year. A special section was added on guard screens for the protection of lines crossing transmission lines. In view of the longer life derived from treated poles and crossarms, a new specification on the butt treatment of cedar poles in open tanks was prepared by the committee. The sub-committee on tools has co-operated with the Western Union in testing a machine for boring pole holes but certain defects developed in the augur, which have not been corrected as yet. The sub-committee on wire crossings has co-operated with the authorities of several states relative to the solution of wire crossing problems.

Specifications for underground construction, which were prepared jointly by the several interested sections of the A.R.A., are now being submitted to the Signal, Electrical and Construction and Maintenance sections of the American Railway Association for approval.

DISCUSSION

It was brought out in the discussion that the proper butt treatment of cedar telegraph poles would prolong their life approximately 10 to 15 years. Statistics would indicate that the needed supply of these poles can be obtained in the United States at reasonable cost for only about 10 or 15 years longer. By proper wood preservative treatment this supply can be conserved. The discussion brought out the fact that installations of reinforced concrete poles have proved satisfactory, but that the main objection to them is their high first cost. Considerable discussion took place as to the proper cable combinations to be used and how these combinations should be specified in ordering.

During the discussion it developed that some had a feeling that an undue hardship would be placed on farmer telephone lines were these companies required to excavate to a depth stated in the specifications in order to carry their wires under the tracks and that such a specification would cause overhead crossings of wire lines to be constructed which is not desirable from a railroad standpoint.

Report on Inside Plant Equipment

In order to standardize the wire used for the inside wiring of instruments, the committee presented specifications for twisted pair waxed-braid rubber insulated wire. The sub-committee on Locations and Layouts, which is co-operating with the Signal Section, presented four new sketches showing the arrangement of interlocking machines, operators table, telegraph apparatus, and other equipment in signal towers, which are designed to eliminate confusion and crowding.

In addition to preparing drawings and specifications for a large number of circuits required in railroad telegraph and telephone plants, the sub-committee on Current and Power Supply presented a complete set of directions for the routine work of telephone maintainers. These directions offer a definite outline for systematic maintenance. In order to insure continuity of service during lightning storms it is essential that the lightning arresters, fuses and other protectors be installed according to the report of the committee on Electrical Protection.

There was considerable discussion as to the minimum size of ground wire to be used with protectors at way stations and other places where such protectors are used.

Report on Recent Developments

Among the new developments reported was the "Pallophotophone," a device for transmitting and recording speech; an arrangement whereby telegraph circuits, long distance telephone circuits and automatic telephone switchboards can be cut in automatically and thereby facilitate these operations; a rectifier designed to provide a source of energy for operating selectors on train dispatching and circuits with a

minimum amount of attendance, with a vacuum tube, the average life of which is 500 continuous hours, or, based on 300 calls a day should be about two years; and a four-element radio receiving tube, operating from an alternating current source without the use of either "A" or "B" batteries. The filament of this tube performs the double function of a cathode for the rectifier that provides the plate voltage, and of a radiant heater for the pliotron cathode, the cylinder which surrounds the filament serving simultaneously as a pliotron cathode and as the anode of the kentron rectifier.

Report on Message Traffic

The experience on some railroads in the use of duplex printer equipment shows that such operations can be justified where printer circuits are already in operation in the same office, and it is the opinion of the committee that the use of newly developed equipment for use on lightly loaded circuits can also be justified, but so far as is known this latter type of equipment is not in use on any railroad at this time.

The committee believes that it would be impracticable to consolidate general telegraph offices in one unit at large centers where a number of railroads maintain headquarters. The committee recommended that joint messenger service be established between the telegraph offices of various railroads where telephone or pony wire operation will not answer the purpose better; the expense of maintaining this service to be pro-rated among the railroads concerned.

The desirability of providing a code word for the name of each railroad in the United States with the view of promoting brevity in telegrams was not recommended, for it is the belief of the committee that it is more conducive to brevity in telegrams handled over railroad wires to employ the initials or the names by which the railroads are generally known. All employees are familiar with this method which reduces the liability to error and expedites handling. Since two of the largest commercial telegraph companies in the United States have authorized the use of any combination of letters to be counted on the basis of one word for each five letters or less, there appears to be no necessity for a code of this character.

Other Reports

Feeling that the future success of the railroad communication facilities depends on the education and training of the employees a committee has been designated to produce a series of pamphlets for the use of the employees. The first book "Elementary Mathematics" has been completed and was presented at this convention.

Many of the physical and electrical factors limiting telephone and telegraph line transmission were explained in detail in one of the reports. However, for the average railroad employee as a user of the telephone, the precaution to "speak distinctly and directly into the transmitter" perhaps has more influence on satisfactory results than any other single factor.

Considerable investigation has been made of the apparatus required for radio equipment to be used in telephone conversations between the engineman in the locomotive and the conductor in the caboose of long freight trains. However, as yet no apparatus has been fully developed and put in practical use.

The Railway Telegraph and Telephone Appliance Association held its annual meeting in connection with the annual meeting of the telegraph and telephone section at Colorado Springs, Colo., on September 19 at which new officers and executive committee were elected for the coming year. F. W. Bayles, New York Telephone Company, New York, was elected chairman; E. V. Adams, Western Electric Company, was elected vice chairman and G. A. Nelson, Waterbury Battery Company, New York, was elected Secretary-treasurer. The members of the executive committee are: B. A. Kaiser, American Telegraph & Telephone Company, New York; J. W. Young, Kerite Insulated Wire & Cable Company, New York; W. J. Hackett, Okonite Company, New York; W. L. Cook, Reliable Electric Company, Chicago; M. L. Clapp, Western Union Telegraph Company, New York, and R. E. Trout, Thomas A. Edison, Inc., Bloomfield, N. J.

Concrete Train Places 25 Signal Foundations a Day

Approximately $1,627 was saved by using a concrete mixer for the mixing of the concrete for signal foundations on a 130-mile single track signal installation now nearly completed on the Northern Pacific between Cheney, Wash., and Pasco. A steam-driven concrete mixer was mounted on a flat car with platforms and chutes for handling the gravel, cement and concrete, built as shown in the illustration. The gravel cars are hauled in the rear of the mixer and a track built of 4 in. by 4 in. timbers extends over the gravel cars so that a push-car may be run back and forth to haul the gravel up to the mixer. One end of the push-car is lifted to dump the gravel, together with the cement, into the mixer. From the mixer the concrete is poured through a trough into the foundation form.

Concrete Mixer Used for Signal Foundations

The total cost of mixing foundations for 230 signals, 7 bracket poles and 13 cable posts was $3,449, or $1,627 less than the estimated cost of this work if it had been done by hand as in previous years. These foundations were all set in 10 days and the actual working time was 56 hr. 47 min., or an average of 13¾ min. to the foundation. Under the old method a concrete gang of seven men placed an average of one signal foundation in two hours or four foundations in an eight-hour day. One concrete gang would have required 62 days to handle the 230 foundations. One cantilever signal foundation which required 23 cu. yd. would have required a concrete gang four days, whereas with the mixer this foundation was placed in 4 hr. There was, therefore, not only a considerable saving in money but the work was handled much quicker and a better mixture was secured than would have been possible with hand mixing.

The Merging of the separate freight terminals of the four roads entering Seattle, Wash., into one operating company, will be urged before the Interstate Commerce Commission in November, according to W. S. Nicholson, chief engineer of the Port of Seattle.

General News Department

The Missouri Pacific will convert 104 locomotives into oil burners.

The telegraphers of the Charleston & Western Carolina have petitioned the Railroad Labor Board for an increase of pay.

In the United States Court at Detroit, Mich., on September 10, the Detroit, Toledo & Ironton was fined $500 for violation of the Safety Appliance Act.

Shopmen on the Cincinnati Northern, including machinists, boilermakers, blacksmiths, sheet metal workers, electrical workers, carmen, helpers and apprentices, have been granted an increase in wages of three cents an hour. This increase is retroactive to August 1.

In a collision at Cottondale, Fla., on Sunday night last, 21 passengers were injured, one of them fatally. Cottondale is 126 miles east of Pensacola on the Louisville & Nashville, and the collision was at the crossing of the Atlanta & St. Andrews Bay Railway. Passenger train No. 1 of the Louisville & Nashville ran into an excursion train of the other road, which was standing on the crossing. The injured passengers were taken to the hospital at Dothan, Ala.

Patrons of the Chicago, Peoria & St. Louis have petitioned the Interstate Commerce Commission for a rehearing on its order permitting the abandonment of the road, according to H. A. Tuohy, traffic commissioner of the Springfield (Illinois) Chamber of Commerce. Cancellation of the commission's order permitting the road to cease carrying interstate freight was also asked. By order of the Circuit court at Springfield, the property is to be sold on September 26 at Springfield.

Material Wanted on Safety Campaigns

The Department of Debating and Public Discussion of the University of Wisconsin, Madison, Wis., is anxious to secure material and get a line on the sources of material on safety first campaigns on the railroads. Since this material will be used both by the student body at the university, and also in connection with the university extension work, it is desirable that several copies of the material be furnished wherever it is possible.

B. L. E. Fire Insurance Company

The Brotherhood of Locomotive Engineers has gone into the insurance business. Incorporation articles for the Brotherhood of Locomotive Engineers Fire Insurance Company of Cleveland, Ohio, have been filed at Columbus. The company will have a capital of $100,000, in 1,000 shares of $100 each. The incorporators are officers of the brotherhood, including Warren S. Stone, president of the organization, who will also be president of the new insurance company. The insurance company will be operated on a plan designed to limit the profits to stockholders.

Injunction Against Great Northern "Company" Union

A temporary injunction restraining the Associated Organization of Shopcraft Employees of the Great Northern from interfering with members of the Federated Shopcrafts has been granted to the latter organization by United States District Judge John B. Sanborn at St. Paul, Minn. Since the formation of the "company" union in July of last year the national shopcrafts' organization claims that its members, returning to work have been denied membership in the local union. B. M. Jewell, president of the federated shopcrafts, is quoted as saying that there is no intention to seek such injunctions in other sections.

Railroad Contributions for Relief of Japan

The Northern Pacific, the Great Northern, the Chicago, Burlington & Quincy and the Chicago, Milwaukee & St. Paul made contributions of $5,000 each to the Japanese earthquake relief fund. These roads also offered transport free all foodstuffs for human consumption destined to Pacific Coast ports for Japanese relief.

The Union Pacific has given $25,000 to the American Red Cross for Japanese relief. The Pennsylvania Railroad has made a subscription of $10,000 for the same purpose.

Five thousand dollars was contributed to the Japanese relief fund by employees and officers of the Chicago & Alton in a campaign ending last week. Receivers for the road also petitioned the Federal court at Chicago for authority to contribute an additional thousand from the company funds.

Bonuses at C. & A. Storehouse

Since installing a bonus system at the general storehouse of the Chicago & Alton as an inducement to fill requisitions promptly, the average number of requisitions being held has been reduced one-half as compared with those held in January, while the average number of days required to fill them has been reduced from 43 to 16. The bonus consists of two days off or two days added to the summer vacation and is given to the stock man making the best record in filling requisitions. A committee of stock men decides the winner of the bonus. On January 1 the number of unfilled department requisitions at the general storehouse for all sections totaled 299, and on June 18 this number had been reduced to 119.

Fatal Inspection Trip on the St. Louis Southwestern

As announced in the *Railway Age* last week, D. W. Bowker, superintendent of the St. Louis Southwestern, at Pine Bluff, Ark., was killed near Plain Dealing, La., on September 7, by the derailment of his inspection car; and it appears that another officer was killed and five others injured. W. O. Sublett, roadmaster at Lewisville, Ark., was the second one killed. W. S. Hanley, chief engineer of the road, and W. E. McGraw, vice-president and general superintendent of the lines in Texas, were seriously injured, while three others were less severely hurt. The car in which the party was riding was a Pierce-Arrow automobile, mounted on flanged wheels. The exact cause of the derailment has not been determined but it is thought that it was due to sudden application of the brakes.

Canadian Union President Attacks Labor Board

The Railway Labor Board was denounced as a "tool of the employers" in an address by A. R. Mosher, president, at the convention of the Canadian Brotherhood of Railway Employees at Calgary, Alta., on September 17. Mr. Mosher also declared the strike to be "too powerful a weapon" for workers engaged in an essential public service to employ. In referring to the Labor Board, Mr. Mosher said, "It is a greater menace to railway employees than any other combination of individuals on the North American continent." He accused the board of aiding railway managements "in their attacks upon the pay envelopes of workers" and referred to it as a "United States Government tribunal which has made itself ridiculous in the eyes of every right thinking person on this continent by declaring that a living wage for workers is impracticable and impossible." He said further that except where the workers directly block the practice, Canadian railways apply the decisions of the board so that employees in the Dominion are as much affected by its judgment as are their fellow craftsmen in the United States, although the Labor Board is not supposed to have jurisdiction on the Canadian side.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1923

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Akron, Canton & Youngstown	July	170	$207,674	$865	$216,591	$33,757	$24,481	$8,467	$72,553	$10,013	$148,813	68.70	$67,778	$53,307	$22,023	$25,545
	7 mos.	170	1,483,748	6,107	1,554,177	227,867	142,304	57,189	467,424	63,980	958,306	61.70	595,871	496,964	311,958	296,112
Alabama & Vicksburg	July	141	188,630	71,699	278,103	38,228	56,879	9,500	87,100	11,126	204,363	73.50	73,740	35,536	45,315	520
	7 mos.	141	1,392,354	417,196	1,949,893	292,629	358,795	64,454	674,379	83,506	1,486,844	76.30	463,049	245,445	307,060	186,591
Vicksburg, Shreveport & Pacific	July	188	219,218	107,712	351,766	46,311	58,244	11,318	112,006	12,789	243,201	69.10	108,565	71,409	62,316	7,295
	7 mos.	181	1,589,402	669,580	2,452,132	328,548	427,706	77,574	809,585	94,830	1,755,850	71.60	696,282	474,558	405,368	204,309
Ann Arbor	July	293	433,226	46,226	507,527	64,391	120,209	9,982	175,895	12,467	382,957	75.40	124,570	104,810	90,161	12,136
	7 mos.	293	2,593,860	275,545	3,011,447	361,067	765,950	63,038	1,327,097	90,871	2,608,009	86.60	403,438	248,945	23,599	268,929
Atchison, Topeka & Santa Fe	July	8,946	11,228,561	4,242,899	16,827,842	2,839,490	4,096,398	286,179	5,362,129	295,160	12,814,559	76.20	4,013,283	2,787,063	2,841,012	4,370,320
	7 mos.	8,946	77,365,417	26,528,274	113,378,812	15,498,733	27,474,625	2,025,959	36,495,571	2,371,835	83,375,326	73.50	30,003,486	21,507,596	22,863,255	15,893,110
Gulf, Colorado & Santa Fe	July	1,908	1,775,722	391,246	2,271,513	441,283	500,449	43,871	668,159	62,974	1,713,941	75.50	557,572	476,211	392,367	508,201
	7 mos.	1,908	9,998,317	2,324,948	13,161,963	2,895,606	3,441,857	313,068	4,541,979	437,678	11,618,365	88.30	1,543,603	974,738	572,793	482,069
Panhandle & Santa Fe	July	858	573,552	127,828	736,977	163,379	252,826	7,658	207,707	16,665	648,062	87.90	88,915	65,784	27,066	55,498
	7 mos.	858	3,321,035	781,606	4,367,599	758,304	1,507,157	54,505	1,428,488	124,396	3,869,913	88.60	498,586	319,866	111,913	—210,667
Atlanta & West Point	July	93	131,132	84,538	243,999	33,750	50,483	11,203	86,400	11,666	198,798	81.50	45,201	31,263	25,282	17,427
	7 mos.	93	972,762	534,261	1,695,150	252,419	279,841	66,795	590,946	82,073	1,299,736	76.60	395,414	297,517	238,537	85,956
Western of Alabama	July	133	139,881	77,813	240,746	31,971	54,617	6,879	79,713	10,366	188,245	78.20	52,501	40,930	41,102	45,297
	7 mos.	133	1,036,570	492,663	1,682,188	220,693	318,994	69,557	534,135	78,945	1,246,150	74.10	436,038	346,548	339,848	225,631
Atlanta, Birmingham & Atlantic	July	639	272,313	67,009	368,295	64,743	90,287	21,709	165,667	17,785	360,273	96.40	8,022	—4,878	—9,982	—43,420
	7 mos.	639	2,143,418	332,008	2,655,171	468,491	626,898	153,143	1,348,612	108,012	2,705,816	102.50	—50,645	—142,700	—186,376	—418,240
Atlantic Coast Line	July	4,860	3,384,972	1,278,830	5,122,886	913,516	1,446,111	104,134	2,173,661	141,208	4,808,372	93.90	314,514	—61,110	—11,111	538,405
	7 mos.	4,860	33,962,006	11,047,926	48,648,673	5,804,289	10,100,047	766,468	17,215,466	1,020,517	35,168,291	72.30	13,480,382	10,899,289	10,182,283	9,383,759
Charleston & Western Carolina	July	342	246,618	39,416	300,936	59,500	42,453	7,032	125,281	6,273	240,539	79.90	60,397	44,342	30,681	29,028
	7 mos.	342	1,979,389	248,753	2,331,740	358,588	311,196	49,025	946,284	46,273	1,711,056	73.40	620,684	528,265	401,121	364,278
Baltimore & Ohio	July	5,212	17,254,089	2,770,835	21,488,806	2,350,217	5,306,842	343,281	7,893,177	478,914	16,505,469	76.80	4,983,337	4,179,094	3,876,611	1,225,067
	7 mos.	5,212	124,863,707	16,967,186	151,286,195	15,212,705	38,038,923	2,273,467	55,940,951	3,371,632	116,018,896	76.70	35,267,299	29,489,789	26,702,519	15,805,362
Baltimore & Ohio, Chicago Term.	July	83	.....	.....	301,481	54,151	50,767	1,949	180,724	9,214	302,495	100.30	—1,014	—35,995	—2,131	108,057
	7 mos.	83	.....	.....	2,170,787	227,079	298,942	13,490	1,254,553	68,538	1,893,322	87.20	277,465	—7,993	257,476	675,588
Staten Island Rapid Transit	July	23	74,126	148,912	262,367	43,939	35,886	1,762	126,981	15,724	224,292	85.50	38,075	25,544	11,623	—4,753
	7 mos.	23	572,150	711,208	1,458,466	211,100	246,919	13,242	822,913	97,962	1,392,136	95.50	66,330	—36,664	—147,350	—298,978
Bangor & Aroostook	July	616	330,450	64,183	422,476	110,882	128,438	3,697	143,497	18,197	407,296	96.40	15,180	—20,812	29,744	18,569
	7 mos.	616	3,221,943	520,611	3,912,909	838,333	844,756	30,759	1,264,263	127,018	3,117,263	79.70	795,646	497,108	811,611	1,371,694
Belt. Ry. of Chicago	July	32	.....	.....	570,676	49,732	57,670	2,718	225,323	8,966	344,409	60.40	226,267	189,056	170,030	133,155
	7 mos.	32	.....	.....	4,170,487	351,598	415,007	16,921	1,842,882	68,938	2,695,346	64.60	1,475,141	1,198,399	1,063,321	962,139
Bessemer & Lake Erie	July	228	2,297,744	33,400	2,371,618	118,321	709,565	15,993	522,763	28,422	1,386,017	58.44	985,601	833,345	880,308	409,865
	7 mos.	228	10,833,608	204,250	11,281,788	747,217	3,286,273	108,241	2,967,874	197,152	7,285,247	64.58	3,996,541	3,443,973	4,511,435	774,295
Bingham & Garfield	July	34	30,180	.....	31,574	14,228	5,335	1,352	8,748	3,650	33,435	105.90	—1,861	—10,510	2,034	2,017
	7 mos.	34	242,823	15	252,125	51,986	33,388	9,444	63,741	25,984	185,644	73.30	67,481	14,241	98,648	—75,069
Boston & Maine	July	2,286	4,347,439	2,187,277	7,397,648	974,866	1,642,654	60,808	3,272,299	219,739	6,194,124	83.70	1,203,524	952,033	616,140	1,029,073
	7 mos.	2,286	31,415,094	13,053,372	50,283,378	7,002,486	11,323,719	381,386	24,889,815	1,487,857	45,243,644	90.00	5,039,734	3,368,052	—220,862	3,974,173
Brooklyn Eastern District Term.	July	9	91,783	.....	98,188	7,094	17,137	277	42,034	4,640	71,182	72.50	27,006	20,397	20,397	38,207
	7 mos.	9	876,041	.....	937,245	39,730	98,678	2,784	341,065	36,151	518,408	55.30	418,837	356,253	358,293	321,939
Buffalo & Susquehanna Ry. Corp.	July	253	205,366	4,717	213,804	44,115	82,494	2,097	63,736	9,069	201,511	94.30	12,293	1,893	49,712	—41,570
	7 mos.	253	1,568,928	38,070	1,633,438	272,868	557,411	14,448	510,684	62,318	1,417,402	86.80	216,036	128,835	484,229	17,069
Buffalo, Rochester & Pittsburgh	July	589	1,627,070	157,872	1,883,307	462,916	590,043	25,467	696,060	43,739	1,810,254	96.10	73,053	37,984	234,772	—190,631
	7 mos.	589	12,130,492	1,017,804	13,686,940	2,230,522	4,566,681	178,902	5,199,615	302,693	12,456,113	91.00	1,230,827	985,358	1,928,621	215,868
Canadian Pacific Lines in Maine	July	233	115,241	31,447	160,660	68,157	38,533	5,088	76,507	3,803	192,088	119.60	—31,428	—46,428	—57,647	—37,616
	7 mos.	233	1,387,079	256,105	1,751,931	315,725	348,875	32,426	824,601	26,537	1,548,164	88.40	203,767	98,767	15,205	45,765
Carolina, Clinchfield & Ohio	July	309	690,774	55,564	762,824	78,277	197,176	25,521	200,792	20,656	522,382	68.50	240,442	190,386	264,739	321,048
	7 mos.	309	5,069,269	313,382	5,483,259	514,643	1,517,544	176,011	1,538,956	136,507	3,881,642	70.80	1,601,617	1,250,715	1,643,681	1,827,464
Central of Georgia	July	1,920	1,564,482	524,824	2,288,760	283,386	495,983	65,371	901,162	82,377	1,836,780	80.20	451,980	347,739	311,907	337,387
	7 mos.	1,920	10,737,025	3,278,204	15,476,271	1,922,488	3,151,083	486,059	6,084,638	570,669	12,275,600	79.30	3,200,671	2,480,163	2,413,833	2,085,224
Central of New Jersey	July	694	3,803,096	1,110,024	5,173,478	546,209	1,372,807	35,775	1,920,742	101,693	3,997,851	77.30	1,175,627	882,701	815,181	78,089
	7 mos.	694	26,325,199	5,385,766	33,713,034	3,110,730	9,184,070	268,937	14,403,081	726,878	27,829,841	82.50	5,883,193	3,810,314	3,331,749	1,759,811
Central Vermont	July	533	506,625	111,719	694,376	139,416	126,724	16,342	319,195	22,032	622,208	89.60	72,168	51,254	26,534	37,710
	7 mos.	533	3,797,875	737,560	5,050,026	714,631	893,449	94,846	2,761,057	144,182	4,616,258	91.40	433,768	288,573	—111,137	58,720
Chesapeake & Ohio	July	2,552	7,409,427	1,070,255	8,937,996	1,130,647	2,396,130	90,671	2,847,914	197,305	6,678,605	74.70	2,259,391	1,953,677	1,976,108	1,690,589
	7 mos.	2,552	47,727,915	6,502,583	57,202,855	6,765,502	15,801,234	602,156	19,237,469	1,294,144	43,897,956	76.70	13,304,899	11,158,369	11,404,153	11,335,246
Chicago & Alton	July	1,050	1,867,218	574,393	2,645,189	398,689	646,315	57,852	915,151	63,743	2,077,737	78.50	567,452	482,965	346,056	—60,489
	7 mos.	1,050	13,622,554	3,860,708	19,012,703	2,260,173	5,138,187	412,530	6,685,749	379,935	14,869,818	78.20	4,142,885	3,548,900	2,735,580	1,093,595
Chicago & Eastern Illinois	July	945	1,563,841	455,151	2,194,685	239,172	749,914	42,733	844,636	68,239	1,955,192	89.10	239,493	109,432	167,845	101,790
	7 mos.	945	12,375,348	2,827,171	16,440,180	1,781,814	5,199,790	311,665	6,448,686	487,189	14,312,326	87.10	2,127,854	1,322,512	1,885,144	1,221,267
Chicago & Northwestern	July	8,462	9,363,423	2,828,603	13,756,617	2,284,127	3,050,945	211,927	5,309,243	340,428	11,252,118	81.80	2,504,499	1,751,041	1,582,475	3,296,288
	7 mos.	8,462	64,943,144	17,169,151	91,697,260	12,414,030	22,511,571	1,186,976	39,389,153	2,361,971	78,251,863	85.30	13,445,397	8,170,240	6,563,412	9,627,691
Chicago, Burlington & Quincy	July	9,405	9,134,420	2,865,446	13,369,117	2,339,816	3,794,792	281,232	5,013,903	377,897	11,918,640	89.20	1,450,477	648,364	522,018	1,969,740
	7 mos.	9,398	72,445,294	16,089,836	98,148,888	12,965,299	24,125,061	1,661,552	37,357,769	2,524,393	79,328,085	80.80	18,820,803	12,579,711	11,553,862	13,628,812
Chicago, Great Western	July	1,496	1,535,169	370,726	2,085,191	479,715	453,376	65,142	865,432	53,421	1,929,542	92.50	155,649	81,717	—14,642	136,916
	7 mos.	1,496	11,201,816	2,445,513	14,873,057	2,241,402	3,314,726	452,209	6,321,262	383,053	12,799,868	86.10	2,073,189	1,522,354	851,162	—11,533

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Chicago, Indianapolis & Louisville	July	657	$1,024,762	$267,009	$1,431,995	$158,480	$322,719	$35,499	$490,293	$32,985	$1,055,689	73.70	$376,306	$291,579	$174,577	$136,814
	7 mos.	657	7,582,237	1,839,900	10,425,219	1,044,822	2,309,415	230,027	3,787,489	238,751	7,716,542	74.00	2,708,677	2,158,960	1,198,182	1,004,950
Chicago, Milwaukee & St. Paul	July	11,010	10,171,755	2,180,296	13,885,058	2,285,791	2,928,698	201,559	5,266,374	319,530	11,062,715	79.70	2,822,343	2,163,204	1,626,996	2,334,534
	7 mos.	11,016	73,541,407	13,874,580	97,562,210	13,517,733	23,532,274	1,322,197	39,501,172	2,198,489	80,460,625	82.50	17,101,585	11,692,526	8,296,011	3,951,689
Chicago, Peoria & St. Louis	July	247	75,111	12,538	98,358	16,940	18,366	1,927	55,281	8,880	101,394	103.10	—3,036	—12,538	—26,034	—17,195
	7 mos.	247	614,548	92,026	775,046	128,936	155,908	15,534	450,813	63,200	814,391	105.10	—39,345	—105,931	—191,462	—265,295
Chicago River & Indiana	July	19	.....	.....	584,113	65,171	55,888	811	227,023	10,737	359,630	61.60	224,483	193,072	248,917	268,154
	7 mos.	19	.....	.....	4,312,053	396,935	466,947	6,921	1,704,915	82,295	2,658,013	61.60	1,654,040	1,397,846	1,938,320	1,483,551
Chicago, Rock Island & Pacific	July	7,635	7,418,275	2,385,438	10,627,018	1,195,622	2,544,145	195,896	4,291,575	282,403	8,426,056	79.30	2,200,962	1,752,220	1,166,532	2,236,951
	7 mos.	7,635	49,842,195	15,030,483	70,226,495	8,859,297	16,949,488	1,335,388	30,248,868	1,803,683	59,427,182	84.60	10,799,313	7,414,347	4,872,504	7,208,077
Chicago, Rock Island & Gulf	July	461	456,403	85,871	587,578	80,772	67,438	13,870	241,213	14,731	418,964	71.30	168,614	156,305	120,919	149,364
	7 mos.	461	2,364,363	521,214	3,164,954	556,207	511,579	92,159	1,573,611	105,036	2,847,342	89.90	317,612	231,226	112,826	389,669
Chicago, St. Paul, Minn. & Omaha	July	1,749	1,448,515	525,566	2,173,595	386,169	476,330	34,302	985,666	73,239	1,961,314	90.20	212,281	104,591	45,914	477,383
	7 mos.	1,749	11,182,683	3,552,258	15,954,625	2,006,064	3,402,650	242,788	7,621,887	495,829	13,822,623	86.60	2,132,002	1,218,791	1,212,718	1,507,759
Cincinnati, Indianapolis & Western	July	347	304,821	41,303	372,229	42,404	79,964	11,109	145,161	19,671	299,599	80.40	72,630	52,132	31,883	19,379
	7 mos.	347	2,207,962	267,653	2,685,023	306,090	576,444	80,639	1,137,738	133,322	2,243,916	83.60	441,107	302,430	147,610	11,148
Colorado & Southern	July	1,099	660,611	233,149	983,912	204,819	311,227	14,562	391,088	42,052	971,279	98.70	12,633	—56,606	—32,694	195,178
	7 mos.	1,099	5,400,316	1,161,542	7,116,304	1,615,231	2,153,116	96,655	2,919,085	298,617	6,536,012	91.80	580,292	121,993	179,222	976,510
Ft. Worth & Denver City	July	456	540,740	219,788	810,091	92,434	154,081	16,241	241,842	34,279	545,975	67.40	264,116	225,811	263,541	248,850
	7 mos.	456	3,614,005	1,128,197	5,075,337	544,228	1,274,225	89,338	1,655,704	242,855	3,827,181	75.40	1,248,156	964,516	1,259,121	1,438,440
Wichita Valley	July	271	79,217	23,157	108,982	14,714	7,977	26	40,873	1,673	63,908	58.60	45,074	37,836	23,315	10,621
	7 mos.	267	548,993	140,449	736,680	126,468	75,566	260	283,889	11,609	494,005	67.10	242,675	199,929	122,160	59,236
Columbus & Greenville	July	167	81,743	30,632	118,542	45,457	39,629	2,544	45,834	8,461	141,785	119.60	—23,243	—25,743	—36,580	27,108
	7 mos.	167	609,773	198,729	857,572	255,281	133,789	22,778	316,729	70,020	797,840	93.00	59,732	60,766	—26,324	44,165
Delaware & Hudson	July	886	3,696,666	403,953	4,364,064	353,579	1,073,698	42,182	1,625,165	136,909	3,265,139	74.80	1,098,925	1,013,811	954,726	—55,863
	7 mos.	886	23,530,161	2,144,364	27,325,634	2,430,218	7,429,770	267,178	11,608,453	984,644	2,925,549	83.90	4,400,085	3,803,507	3,465,301	1,438,405
Delaware, Lackawanna & Western	July	993	5,438,012	1,366,938	7,630,365	723,089	1,500,036	103,732	2,947,049	156,578	5,489,641	71.90	2,140,724	1,678,905	1,778,639	529,420
	7 mos.	993	37,028,354	7,919,557	50,830,461	4,431,107	12,687,897	729,848	21,973,182	1,084,445	41,291,256	81.20	9,539,205	6,548,750	7,152,289	5,255,490
Denver & Rio Grande Western	July	2,593	1,836,854	707,464	2,833,785	637,612	817,126	40,792	1,029,807	82,943	2,678,278	94.50	155,507	—12,942	88,307	962,779
	7 mos.	2,593	13,342,244	3,159,690	18,133,010	2,643,050	5,590,819	338,930	6,977,745	577,744	16,452,579	90.70	1,680,431	501,682	1,085,592	3,615,930
Denver & Salt Lake	July	255	209,733	40,763	274,111	66,534	74,805	1,829	86,000	5,776	234,944	85.70	39,167	30,165	35,626	—74,154
	7 mos.	255	1,068,853	146,243	1,361,010	297,093	517,870	8,154	523,342	40,770	1,387,229	101.90	—26,219	—89,358	—67,663	—1,723,742
Detroit & Mackinac	July	375	115,034	34,157	167,810	43,512	47,202	1,956	55,248	4,928	152,612	90.90	15,198	5,691	10,676	27,766
	7 mos.	383	768,982	205,296	1,066,027	228,368	328,219	14,200	425,996	40,059	1,036,136	97.20	29,891	—23,583	38,041	—81,574
Detroit & Toledo Shore Line	July	61	319,897	.....	326,177	37,407	61,990	2,280	110,039	5,581	217,297	66.60	108,880	90,580	23,701	39,236
	7 mos.	61	2,477,517	.....	2,513,548	208,085	240,728	16,593	759,116	48,913	1,273,435	50.70	1,240,113	1,112,013	506,837	539,507
Detroit, Toledo & Ironton	July	454	899,628	10,491	930,667	138,408	119,825	5,793	271,055	22,564	555,325	59.70	375,342	361,625	206,021	—16,367
	7 mos.	454	5,772,998	66,779	5,962,103	766,232	924,083	44,971	2,051,448	162,589	3,875,924	65.00	2,086,179	1,995,942	1,065,888	689,151
Duluth & Iron Range	July	279	1,053,228	16,018	1,155,512	122,652	133,796	1,319	257,388	21,348	537,091	46.50	618,421	532,254	539,555	756,833
	7 mos.	279	3,661,373	130,714	4,148,892	672,827	907,617	8,473	1,411,973	130,940	3,134,677	75.60	1,014,215	713,693	728,778	860,821
Duluth, Missabe & Northern	July	305	3,380,609	15,329	3,711,247	219,820	179,271	3,361	540,544	20,554	964,470	26.00	2,746,777	2,428,907	2,428,963	1,762,813
	7 mos.	305	8,972,064	144,599	10,086,493	1,131,227	1,346,658	20,488	2,242,071	143,398	4,893,600	48.50	5,192,893	3,874,065	3,854,855	1,948,591
Duluth, South Shore & Atlantic	July	591	337,325	120,266	516,135	76,196	60,593	6,197	221,424	12,416	392,613	76.10	123,522	95,519	73,093	101,927
	7 mos.	591	2,384,188	670,588	3,326,822	434,767	525,353	44,011	1,652,881	83,794	2,780,255	83.60	546,567	344,498	209,748	—156,845
Duluth, Winnipeg & Pacific	July	178	146,927	22,083	175,179	38,911	35,257	2,941	74,254	12,117	163,485	93.30	11,694	2,935	—7,887	—32,394
	7 mos.	178	1,280,462	157,867	1,486,465	241,125	300,527	24,786	629,704	48,878	1,244,407	83.70	242,058	122,945	108,513	—19,067
Elgin, Joliet & Eastern	July	459	1,125,101	11	2,422,837	220,532	481,836	11,687	731,810	40,214	1,485,490	61.30	937,347	826,972	607,316	582,969
	7 mos.	459	15,002,214	67	16,800,355	1,221,906	4,045,366	84,440	5,174,022	258,173	10,781,884	64.20	6,018,471	5,375,566	4,024,723	3,460,135
El Paso & Southwestern	July	1,139	909,627	172,286	1,130,360	188,317	211,216	32,617	293,563	41,210	775,675	68.60	354,685	248,826	208,113	839,770
	7 mos.	1,139	5,946,616	1,239,389	7,572,742	1,324,368	1,510,612	249,619	2,078,458	286,807	5,514,321	72.80	2,058,421	1,374,300	1,216,340	1,146,368
Erie	July	2,039	7,771,370	1,391,240	9,909,102	1,391,945	2,797,915	141,135	3,664,569	281,936	8,329,243	84.10	1,579,859	1,237,319	1,509,650	—555,181
	7 mos.	2,039	57,212,813	7,730,347	69,952,383	7,294,732	19,551,245	951,156	28,410,577	1,990,500	58,524,820	83.70	11,427,563	9,073,756	9,740,531	3,444,727
Chicago & Erie	July	269	994,991	86,751	1,148,184	145,743	186,629	20,846	396,985	35,180	783,502	68.20	364,682	312,113	—12,226	—187,152
	7 mos.	269	7,125,498	429,175	8,051,782	803,789	1,380,919	145,118	3,124,295	262,940	5,715,720	71.00	2,336,062	1,973,293	—263,388	—780,249
New Jersey & New York	July	45	19,892	116,518	141,063	22,088	19,808	1,467	64,502	3,779	111,643	79.10	29,420	26,090	—4,192	—8,678
	7 mos.	45	175,682	699,754	911,385	106,974	151,526	9,458	485,585	28,102	781,640	85.80	129,745	105,780	—93,297	—75,858
N. Y., Susquehanna & Western	July	135	295,966	65,871	402,527	65,779	90,629	3,784	215,597	11,968	387,753	96.30	14,774	—16,282	—22,559	—37,716
	7 mos.	135	2,144,723	420,532	2,925,938	364,044	527,576	25,559	1,606,322	85,185	2,608,670	89.20	317,268	97,416	66,971	—94,943
Evansville, Ind. & Terre Haute	July	137	137,567	6,306	151,452	32,003	9,674	1,943	56,473	2,945	99,378	65.60	52,074	47,838	9,611	—29,148
	7 mos.	137	858,413	46,722	954,397	251,238	68,943	12,675	401,390	20,948	742,007	77.70	212,390	182,754	—67,268	—257,380
Florida East Coast	July	764	442,003	231,550	802,273	178,958	212,801	9,592	326,321	28,888	764,132	95.20	38,141	—76,300	—120,539	913
	7 mos.	764	5,874,752	3,114,476	10,222,366	1,248,954	1,403,658	98,215	2,947,467	210,104	6,006,162	58.80	4,216,204	3,530,304	3,033,331	2,514,101
Fort Smith & Western	July	249	80,374	25,129	115,363	26,390	23,581	4,942	40,476	6,935	103,128	89.40	12,235	6,124	2,572	16,770
	7 mos.	249	653,094	157,735	880,420	178,451	178,701	34,036	318,201	50,960	765,657	87.00	114,763	73,664	39,309	17,653
Galveston Wharf Co.	July	13	.....	.....	103,747	38,008	5,053	600	28,237	4,402	87,528	84.40	16,219	—3,781	—3,691	—9,857
	7 mos.	13	.....	.....	754,753	247,315	26,349	4,511	213,968	22,676	580,511	76.90	174,242	52,174	53,864	—78,383
Georgia R. R.	**July**	**328**	**341,666**	**114,366**	**489,649**	**55,324**	**99,432**	**19,742**	**206,940**	**20,081**	**401,275**	**82.00**	**88,374**	**81,460**	**70,382**	**76,297**
	7 mos.	**328**	**2,553,572**	**728,447**	**3,503,799**	**373,602**	**662,728**	**144,807**	**1,497,929**	**138,067**	**2,817,463**	**80.40**	**686,336**	**639,212**	**576,336**	**378,409**

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Georgia & Florida	July	405	$114,753	$21,833	$146,182	$18,033	$17,709	$8,507	$60,452	$7,712	$112,625	77.10	$33,557	$27,248	$18,365	$241
	7 mos.	405	804,177	135,043	997,419	125,291	131,245	58,281	411,295	50,106	777,697	78 00	219,722	174,952	111,690	19,897
Grand Trunk Western	July	347	1,389,319	245,688	1,766,260	185,188	355,664	42,184	535,331	53,710	1,182,337	66.90	583,923	525,963	227,883	295,204
	7 mos.	347	9,628,181	1,306,370	11,610,452	976,729	2,251,356	220,909	4,333,655	347,554	8,183,544	70.50	3,426,908	3,013,438	1,162,336	25,720
Atlantic & St. Lawrence	July	166	133,363	22,900	166,049	150,917	35,604	12,768	130,773	9,163	340,830	205.20	—174,781	—189,931	283,247	—93,438
	7 mos.	166	1,601,901	219,064	1,911,183	445,966	411,410	37,213	1,305,311	56,385	2,263,104	118.40	—351,921	—458,024	—1,162,062	—588,525
Chic., Det. & Canada Gr. Tr. Jct.	July	59	248 601	8,621	290,901	21,751	16,147	4,858	76,257	4,021	123,024	42.30	167,877	156,551	125,949	71,763
	7 mos.	59	1,730,810	64,982	2,039,193	108,689	130,487	25,309	612,121	25,628	902,164	44.20	1,137,029	1,072,625	869,201	438,612
Detroit, Grand Haven & Milwaukee	July	189	524,456	38,191	608,782	104,991	66,237	12,296	278,178	18,324	481,550	79.10	127,232	124,115	25,208	122,81.
	7 mos.	189	3,262,692	287,879	3,908,020	495,663	493,372	64,437	1,816,430	110,430	2,984,115	76.40	923,905	893,601	281,371	294,752
Great Northern	July	8,256	7,450,198	1,556,621	10,013,916	1,474,115	1,471,922	159,415	3,508,897	205,868	6,846,563	68.40	3,167,353	2,439,144	2,469,897	2,409,924
	7 mos.	8,255	47,742,057	8,708,684	62,557,621	9,459,695	13,553,408	1098,582	26,443,223	1,442,568	52,110,499	83.30	10,447,122	5,582,367	6,761,167	6,449,503
Green Bay & Western	July	234	85,509	13,139	107,004	21,184	22,531	2,327	37,470	2,567	86,020	80.30	20,984	12,984	13,591	16,812
	7 mos.	234	593,318	104,082	754,626	130,604	162,014	17,576	312,981	19,565	642,462	85.10	112,164	55,788	77,345	107,235
Gulf Coast Lines	July	922	718,633	183,628	955,166	146,238	140,362	28,562	243,592	34,739	590,724	61.90	364,382	311,819	313,148	194,755
	7 mos.	922	4,731,556	1,161,787	6,274,952	1,015,689	984,958	197,246	1,739,101	248,216	4,171,724	66.40	2,103,228	1,741,927	1,672,333	1,437,964
Gulf & Ship Island	July	307	183,350	46,473	257,149	56,242	40,589	7,068	79,834	12,319	205,626	80.00	51,523	30,009	23,846	58,631
	7 mos.	307	1,428,203	274,677	1,897,552	330,239	273,781	56,443	566,074	93,088	1,389,455	73.20	508,097	340,110	279,621	318,474
Gulf, Mobile & Northern	July	465	414,508	46,172	480,421	64,802	80,566	16,306	176,428	15,398	353,500	73.60	126,921	99,073	92,504	43,643
	7 mos.	465	2,986,781	284,506	3,403,154	504,239	574,204	117,495	1,219,304	119,781	2,532,713	74.40	870,441	686,215	564,991	508,116
Hocking Valley	July	348	1,444,916	92,011	1,680,719	177,117	536,234	14,973	460,911	40,942	1,229,856	73.20	450,863	350,056	305,331	116,769
	7 mos.	348	8,983,957	639,417	10,313,443	920,968	3,464,896	94,023	3,091,884	253,763	7,820,656	75.80	2,492,787	1,901,509	1,955,555	1,655,247
Illinois Central	July	4,839	9,845,790	2,307,149	13,027,997	2,399,119	3,136,036	182,482	4,826,659	306,758	10,889,191	83.60	2,138,806	1,429,287	1,376,912	1,662,591
	7 mos.	4,839	75,955,957	15,289,027	98,259,505	13,634,414	23,467,360	1,337,612	37,232,464	2,201,980	78,083,324	79.50	20,176,181	14,605,369	14,081,056	13,019,671
Yazoo & Mississippi Valley	July	1,380	1,175,216	355,719	1,622,988	380,302	339,556	22,848	604,844	42,382	1,371,802	84.50	251,186	144,657	130,411	—14,317
	7 mos.	1,380	8,554,446	2,340,520	11,559,761	2,720,433	2,586,452	162,416	4,572,958	305,718	10,295,661	89.20	1,244,100	471,192	378,889	128,597
Ill. Cen. & Yazoo & Miss. Valley	July	6,219	11,021,006	2,662,868	14,650,985	2,779,421	3,475,592	205,330	5,431,503	349,140	12,260,993	83.70	2,389,992	1,573,944	1,507,323	1,648,274
Combined Report	7 mos.	6,219	84,510,403	17,629,547	109,799,266	16,354,847	26,053,812	1,500,028	41,805,422	2,507,698	88,378,985	80.50	21,420,281	15,076,561	14,459,945	13,148,268
International & Great Northern	July	1,159	822,140	228,099	1,149,171	240,501	214,265	30,605	445,909	48,107	980,363	85.31	168,808	135,984	117,144	69,299
	7 mos.	1,159	5,850,619	1,390,367	7,977,205	1,547,497	1,528,678	205,002	3,217,970	330,694	6,857,656	85.96	1,119,549	891,418	662,238	609,741
Kansas City, Mexico & Orient	July	272	190,390	12,419	213,434	30,312	38,073	5,730	92,600	5,507	172,222	80.70	41,212	36,212	30,136	—10,500
	7 mos.	272	874,768	55,566	999,228	218,273	220,813	38,295	493,724	37,904	1,009,009	101.00	—9,781	—58,538	—44,002	—149,652
Kan. City, Mex. & Orient of Tex.	July	465	162,804	12,504	181,426	28,403	33,855	6,045	67,563	5,694	141,560	78.00	39,866	39,673	24,491	175
	7 mos.	465	857,497	70,309	974,832	191,521	248,532	40,073	513,612	39,421	1,032,765	105.90	—57,933	—95,434	—197,823	—308,488
Kansas City Southern	July	767	1,246,919	202,483	1,602,090	273,015	350,708	39,596	549,007	65,885	1,278,258	79.80	323,832	235,610	216,403	199,855
	7 mos.	767	9,090,295	1,244,035	11,346,353	1,556,631	2,385,381	270,495	3,990,762	488,186	8,689,747	76.60	2,656,606	2,041,884	1,801,267	1,674,797
Texarkana & Fort Smith	July	95	195,256	19,328	231,727	19,183	32,932	4,725	62,670	8,806	128,316	55.40	103,411	91,695	64,610	25,674
	7 mos.	95	1,289,117	107,856	1,535,936	129,457	160,049	35,648	411,905	60,262	796,413	51.90	739,523	659,003	482,271	215,365
Kausas, Oklahoma & Gulf	July	314	140,997	12,452	159,409	41,948	25,392	6,851	72,506	11,109	157,899	99.10	1,510	—8,411	—13,058	25,436
	7 mos.	314	1,367,058	78,586	1,497,078	268,954	255,280	48,059	592,035	80,189	1,245,286	83.20	251,792	182,110	82,549	252,853
Lake Superior & Ishpeming	July	33	203,927	55	245,577	21,702	13,112	214	40,884	3,091	79,003	32.20	166,574	157,658	157,091	158,461
	7 mos.	33	570,241	537	683,875	140,222	102,077	1,844	165,123	20,505	429,771	62.80	254,104	201,404	207,548	105,567
Lake Terminal R. R.	July	13	.....	.....	104,178	26,334	21,078	.....	57,881	2,122	107,415	103.10	—3,237	—9,256	—3,366	14,891
	7 mos.	13	.....	.....	675,003	105,579	108,171	.....	392,044	12,626	618,420	91.60	56,583	11,861	38,876	216,932
Lehigh & Hudson River	July	96	271,485	3,022	284,478	31,684	43,857	1,344	99,463	8,792	185,140	65.10	99,338	84,238	56,759	—6,013
	7 mos.	96	1,630,326	22,833	1,742,433	165,816	272,586	11,301	644,245	60,100	1,154,048	66.20	588,385	503,783	434,294	66,045
Lehigh & New England	July	219	543,137	1,769	551,877	78,524	103,818	5,991	160,438	15,691	364,380	66.00	187,497	160,475	169,157	—12,376
	7 mos.	219	3,512,852	13,974	3,582,498	374,591	917,136	53,269	1,084,516	118,280	2,547,076	71,10	1,035,422	878,937	948,131	122,888
Lehigh Valley	July	1,335	5,654,819	703,428	6,825,097	742,500	2,170,203	97,852	2,604,064	134,155	5,777,937	84.70	1,047,160	837,642	848,660	55,008
	7 mos.	1,335	35,772,712	4,086,304	43,105,725	4,267,231	15,083,037	672,503	18,827,134	884,811	39,903,208	92.60	3,202,517	1,734,742	1,480,380	1,857,816
Los Angeles & Salt Lake	July	1,208	1,200,494	614,452	2,011,810	329,847	500,531	57,847	644,870	54,936	1,647,458	81.90	364,352	251,187	144,042	257,827
	7 mos.	1,177	8,797,784	3,619,605	13,523,858	2,192,236	3,213,878	358,355	4,352,388	359,240	10,782,480	79.70	2,741,378	1,948,613	1,605,063	708,324
Louisiana & Arkansas	July	302	212,636	35,584	257,140	60,669	46,490	8,366	85,383	8,377	207,504	80.60	49,636	32,148	30,635	90,259
	7 mos.	302	1,908,612	230,092	2,196,103	346.450	303,246	55,183	683,367	60,372	1,443,986	65.80	752,117	570,646	526,714	402,335
Louisiana Ry. & Nav. Co.	July	343	241,758	32,812	288,725	66,992	52,212	11,641	113,696	11,385	255,869	88.60	32,856	15,648	—930	34,256
	7 mos.	343	1,932,212	213,048	2,262,060	450.527	446,863	74,611	917,003	77,847	1,966,010	86.90	296,050	174,206	26,765	—65,521
Louisiana Ry. & Nav. Co. of Tex.	July	206	76,238	12,864	94,021	17,845	14,423	2,666	47,688	4,921	87,543	93.10	6,478	2,478	—11,270	.....
	7 mos.	206	271,661	48,944	340,106	67,266	50,640	11,948	189,193	17,758	336,804	99.00	3,302	—12,698	—57,095	.....
Louisville & Nashville	July	5,049	8,129,877	2,455,252	11,314,850	1,537,272	2,891,586	221,389	4,302,156	254,494	9,243,002	81.70	2,071,848	1,669,919	1,682,611	1,312,463
	7 mos.	5,042	58,411,255	14,632,140	77,937,745	9,992,382	19,568,253	1,617,320	29,460,909	1,674,718	62,615,845	80.30	15,321,900	12,040,937	12,416,930	11,151,909
Louisville, Henderson & St. Louis	July	199	196,015	69,088	283,727	79,836	38,138	6,833	90,472	9,528	224,807	79.20	58,920	36,019	25,736	59,635
	7 mos.	199	1,420,702	435,373	1,985,542	416,067	264,612	45,615	657,385	63,444	1,447,123	72.90	538,419	454,036	360,241	299,263
Maine Central	July	1,201	1,232,591	482,774	1,870,633	279,617	338,071	14,513	804,572	46,422	1,495,664	80.00	374,969	275,933	274,446	335,417
	7 mos.	1,201	8,596,259	2,714,737	12 275,163	2,021,985	2.244,564	97,909	5,897,271	332,508	10,613,667	86.50	1,661,496	971,811	774,714	1,309,296
Midland Valley	July	365	287,099	66,668	374,643	92,931	41,001	5,902	102,798	15,207	254,742	68.00	119,901	104,696	96,004	95,768
	7 mos.	365	2,036,382	436,599	2,598,801	449,622	353,315	36,824	804,656	125,303	1,739,360	66.90	859,441	751,560	683,847	880,038
Minneapolis & St. Louis	July	1,649	982,249	127,596	1,179,025	130,179	393,641	26,781	555,137	42,932	1,148,726	97.40	30,299	—7,529	—69,607	197,054
	7 mos.	1,649	7,818,674	1,009,945	9,329,452	1,198,832	2,293,588	180,061	4,258,713	308,525	8,237,267	88.30	1,092,185	650,414	462,011	464,477

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Minneapolis, St. P'l & S. St. Marie	July	4,402	$3,114,173	$811,123	$4,357,176	$606,695	$645,666	$62,425	$1,580,490	$110,538	$3,038,118	69.70	$1,319,058	$1,058,990	$1,025,279	$1,527,363
	7 mos.	4,391	21,341,604	4,387,671	28,009,667	3,617,084	5,026,974	408,203	12,238,238	761,319	22,164,417	79.10	5,845,250	4,015,936	3,974,934	2,037,685
Mississippi Central	July	257	110,708	19,423	134,388	36,483	28,948	5,943	50,011	7,722	129,053	96.00	5,335	335	—1,035	18,688
	7 mos.	257	905,707	109,364	1,051,052	214,980	180,393	39,501	358,458	50,455	843,716	80.20	207,336	170,246	151,638	73,431
Missouri & North Arkansas	July	364	86,262	26,592	120,585	21,244	24,470	3,389	44,364	6,552	100,019	82.90	20,566	28,320	27,254	—18,665
	7 mos.	364	623,343	145,884	819,250	153,930	120,562	22,355	367,238	47,135	701,220	85.60	118,030	100,730	39,816	—24,242
Missouri-Kansas-Texas	July	1,882	2,266,693	531,056	3,011,458	420,936	733,628	47,689	845,646	83,742	2,139,904	71.10	871,554	679,337	780,607	884,201
	7 mos.	1,932	14,624,541	3,417,798	19,766,991	1,958,413	5,813,594	359,884	6,016,780	762,148	14,951,961	75.60	4,815,030	3,676,517	4,615,334	5,164,624
Missouri-Kansas-Texas of Texas	July	1,389	1,093,188	423,215	1,638,989	261,761	284,482	38,412	609,282	65,892	1,263,935	77.10	375,054	328,724	160,999	140,062
	7 mos.	1,539	7,005,842	2,843,814	10,927,966	1,482,636	2,347,325	282,145	4,653,140	539,216	9,302,770	85.10	1,625,196	1,266,496	—72,811	1,195,218
Missouri Pacific	July	7,171	6,951,862	1,747,882	9,486,461	1,393,279	2,490,541	173,040	3,658,894	276,530	8,053,754	84.90	1,432,707	1,048,785	829,078	1,067,788
	7 mos.	7,171	47,013,202	10,637,740	63,184,734	8,837,599	16,990,403	1,096,496	25,548,040	1,895,537	54,669,616	86.50	8,515,118	5,876,656	4,087,621	4,523,886
Mobile & Ohio	July	1,165	1,293,069	172,733	1,550,777	228,500	291,308	45,130	583,306	45,034	1,193,568	77.00	357,209	278,432	214,267	187,369
	7 mos.	1,165	10,152,703	1,111,345	11,912,876	1,457,310	2,647,457	320,862	4,360,107	324,384	9,110,394	76.50	2,802,482	2,183,665	1,873,459	1,457,019
Monongahela	July	106	453,232	35,966	498,462	63,476	104,228	1,066	145,170	9,552	323,492	64.90	174,970	164,953	71,547	—26,877
	7 mos.	106	3,041,781	267,292	3,348,665	383,365	707,895	7,830	1,037,307	64,461	2,200,858	65.70	1,147,807	1,078,050	541,041	414,352
Monongahela Connecting	July	7	.....	.....	236,261	25,522	37,869	562	117,044	5,655	186,652	79.00	49,609	47,151	23,519	—392
	7 mos.	7	.....	.....	1,589,527	182,153	262,925	3,982	816,261	34,644	1,299,965	81.80	289,562	272,930	119,916	192,998
Montour	July	57	240,285	392	243,188	42,508	64,472	969	42,559	7,341	157,851	64.90	85,337	70,306	93,770	—38,487
	7 mos.	57	1,408,783	3,457	1,429,980	222,639	356,464	7,672	278,563	49,858	915,198	64.40	514,782	420,742	612,682	—43,951
Nashville, Chattanooga & St. Louis	July	1,258	1,383,691	450,657	1,961,429	408,552	525,805	64,276	773,943	61,137	1,835,908	93.60	125,521	65,221	107,885	360,578
	7 mos.	1,258	10,421,030	2,843,068	14,220,199	2,211,959	3,321,199	512,728	5,545,853	430,163	12,054,050	84.80	2,166,149	1,742,514	2,006,256	1,352,658
Nevada Northern	July	165	72,761	11,889	89,397	11,764	4,529	901	14,893	4,335	36,422	40.70	52,975	46,367	46,806	25,023
	7 mos.	165	434,326	62,935	532,518	82,010	37,865	3,920	99,617	24,365	247,777	46.50	284,741	238,523	246,768	58,046
Newburgh & South Shore	July	7	.....	.....	174,940	23,060	55,239	.....	64,611	3,934	148,289	84.80	26,651	10,803	7,235	2,495
	7 mos.	7	.....	.....	1,236,030	119,563	362,942	.....	527,600	29,680	1,044,524	84.50	191,506	101,955	44,957	245,366
New Orleans Great Northern	July	274	185,912	44,738	240,446	32,281	38,459	5,476	76,436	9,877	163,134	67.80	77,312	59,753	56,839	72,662
	7 mos.	274	1,359,636	232,024	1,652,446	213,787	267,257	40,117	500,688	74,552	1,099,684	66.50	552,762	435,002	434,144	301,906
New York Central	July	6,899	22,079,384	9,499,624	35,605,194	4,281,448	8,064,183	333,055	11,779,876	838,390	25,673,264	72.11	9,931,930	7,722,043	7,668,985	3,922,261
	7 mos.	6,898	16,388,560	55,808,245	249,281,450	26,158,820	59,736,783	2,223,761	89,162,237	5,831,077	185,764,308	74.52	63,517,142	48,919,852	47,348,176	29,501,746
Cincinnati Northern	July	244	398,021	15,703	421,472	70,418	61,805	4,894	136,588	8,147	281,710	66.80	139,762	118,667	81,346	—14,757
	7 mos.	244	2,941,199	96,106	3,087,266	487,601	498,947	32,460	1,037,264	52,224	2,107,552	68.30	979,714	825,690	533,482	211,134
Cleve., Cincin., Chicago & St. L.	July	2,407	5,456,001	1,649,530	7,708,227	1,085,963	1,518,399	118,329	2,793,514	190,167	5,757,836	74.70	1,950,391	1,522,373	1,459,363	798,687
	7 mos.	2,407	40,993,936	10,125,277	55,567,900	6,039,207	12,438,597	745,283	20,337,076	1,279,576	41,181,161	74.10	14,386,739	11,332,070	10,865,204	9,208,462
Indiana Harbor Belt	July	119	.....	.....	924,073	126,254	122,714	4,951	386,305	22,300	662,524	71.70	261,549	227,171	145,840	190,971
	7 mos.	119	.....	.....	6,731,061	714,118	907,782	30,971	2,997,112	149,233	4,799,216	71.30	1,931,845	1,729,385	907,453	1,186,152
Michigan Central	July	1,862	4,771,725	2,232,872	7,704,394	930,322	1,426,772	94,471	2,396,736	153,207	5,083,484	66.00	2,620,910	2,097,449	1,915,662	1,394,075
	7 mos.	1,862	38,675,207	12,018,425	56,040,456	5,922,843	10,585,454	678,961	18,766,694	1,021,313	37,494,815	66.90	18,545,641	15,109,254	13,444,390	9,118,561
Pittsburgh & Lake Erie	July	231	3,580,821	319,046	4,014,362	489,318	1,098,679	24,875	1,023,303	63,606	2,701,738	67.30	1,312,624	1,044,922	1,365,415	153,504
	7 mos.	231	24,422,455	1,871,973	26,880,301	2,638,962	6,706,466	140,929	7,505,622	441,156	17,445,018	64.90	9,435,283	7,722,529	10,277,636	309,832
New York, Chicago & St. Louis*	July	1,696	4,111,752	306,307	4,609,235	642,354	931,116	109,305	1,617,352	153,083	3,460,552	75.10	1,148,683	879,567	803,974	875,316
	7 mos.	1,696	30,953,306	1,311,430	33,629,941	3,712,562	6,569,959	745,607	12,127,984	1,048,795	24,254,888	72.10	9,375,053	7,530,566	6,563,126	5,712,596
New York, New Haven & Hartford	July	2,000	5,840,513	4,559,829	11,601,347	1,510,693	2,644,604	66,676	4,319,692	274,824	8,978,574	77.40	2,622,773	2,183,954	1,693,147	1,094,321
	7 mos.	2,000	39,878,188	28,514,406	77,584,810	8,679,569	18,577,761	406,387	32,280,704	1,974,254	63,114,643	81.30	14,470,167	11,510,724	5,624,176	7,989,877
Central New England	July	295	679,367	16,225	731,014	123,030	103,909	4,825	228,110	11,060	470,027	64.30	260,987	236,920	214,793	—23,072
	7 mos.	295	4,101,857	114,104	4,401,266	723,105	923,318	32,059	1,692,968	74,375	3,444,918	78.30	956,348	789,812	346,989	590,912
New York, Ontario & Western	July	569	742,252	712,503	1,681,086	243,253	300,000	15,348	571,986	33,096	1,164,463	69.30	516,623	473,749	443,612	271,625
	7 mos.	569	5,155,374	1,682,094	8,074,525	1,069,388	1,800,000	105,553	3,914,610	228,086	7,123,936	88.20	950,589	652,148	392,943	511,644
Norfolk & Western	July	2,238	7,269,136	925,152	8,532,136	1,197,414	2,146,719	88,470	2,718,685	150,361	6,310,403	74.00	2,221,732	1,669,138	1,872,201	2,126,625
	7 mos.	2,237	45,542,054	5,692,671	53,471,082	7,080,769	14,073,642	572,329	18,561,662	1,078,431	41,482,489	77.60	11,988,593	8,483,477	10,764,834	15,701,167
Norfolk Southern	July	931	500,023	154,832	702,723	110,851	118,958	23,239	284,617	26,571	565,311	80.40	137,412	98,930	83,159	94,613
	7 mos.	931	4,228,756	809,606	5,345,184	709,357	829,785	162,669	2,222,600	202,334	4,130,823	77.30	1,214,361	945,427	674,600	566,118
Northern Pacific	July	6,668	5,624,371	1,640,946	8,098,515	1,516,631	2,012,434	176,485	2,994,990	207,808	6,996,610	86.40	1,101,905	370,208	609,319	1,874,314
	7 mos.	6,668	40,572,678	9,116,311	54,745,642	8,568,070	14,109,050	1,223,224	22,479,450	1,513,352	48,486,575	88.60	6,259,067	1,339,378	4,530,962	4,592,553
Northwestern Pacific	July	496	497,596	315,286	884,038	95,903	115,750	8,740	257,692	18,231	495,536	56.10	388,502	341,944	323,080	281,619
	7 mos.	496	2,514,511	1,523,052	4,460,563	772,332	728,455	52,056	1,624,475	128,993	3,314,007	74.30	1,146,556	805,047	721,825	770,592
Pennsylvania R. R. Co.	July	10,478	44,749,057	13,722,367	63,771,357	8,778,186	16,192,844	652,744	23,990,658	1,419,116	51,833,861	81.30	11,937,496	8,555,305	7,512,482	3,179,722
	7 mos.	10,478	294,711,322	88,090,899	419,901,728	47,274,552	110,644,230	4,406,963	166,710,397	10,056,142	344,769,750	82.10	75,131,978	57,517,573	48,837,612	44,944,853
Baltimore, Chesapeake & Atlantic	July	87	117,000	65,381	187,595	27,550	34,126	2,309	97,648	3,507	165,140	88.00	22,455	10,257	9,818	45,759
	7 mos.	87	579,311	226,872	840,478	103,069	310,813	12,856	552,752	27,504	1,006,994	119.80	—116,516	—190,400	—189,970	—45,620
Long Island	July	397	823,625	2,545,462	3,617,667	353,406	411,449	34,558	1,256,028	60,600	2,129,755	58.80	1,487,912	1,223,370	824,200	1,111,019
	7 mos.	397	6,015,878	11,597,500	19,248,800	2,234,965	3,359,597	140,183	8,481,497	447,306	14,772,749	76.70	4,476,051	3,569,060	2,141,832	3,047,935
Maryland, Delaware & Virginia	July	82	78,796	49,538	131,762	6,244	12,367	1,854	73,443	2,116	96,024	72.90	35,738	30,488	28,780	10,420
	7 mos.	82	416,999	159,426	600,052	54,823	199,325	9,743	434,490	16,639	715,020	119.20	—114,968	—125,420	—134,271	—103,544

*Includes the Toledo, St. Louis & Western.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
West Jersey & Seashore	July	359	$404,756	$1,148,369	$1,657,570	$191,108	$241,347	$17,581	$604,702	$26,165	$1,093,682	66.00	$563,888	$337,153	$312,870	$351,079
	7 mos.	359	2,973,498	4,293,196	7,890,077	1,377,689	1,467,737	96,492	3,589,904	180,285	6,796,403	86.10	1,093,674	651,524	502,919	537,743
Peoria & Pekin Union	July	19	19,703	2,453	129,519	34,799	16,535	707	56,915	7,989	116,945	90.30	12,574	2,574	29,689	44,198
	7 mos.	19	147,218	19,701	1,006,685	169,892	106,274	3,376	438,470	64,434	782,446	70.70	224,239	139,239	317,756	295,916
Pere Marquette	July	2,262	2,795,155	588,316	3,745,938	607,003	824,198	43,442	1,396,791	103,452	2,984,243	79.70	761,695	588,577	442,056	527,563
	7 mos.	2,221	20,543,761	3,038,536	26,010,556	2,938,932	5,664,891	345,616	10,030,068	751,897	19,755,444	76.00	6,255,112	5,268,157	3,893,867	3,154,247
Philadelphia & Reading	July	1,125	7,315,936	919,327	8,664,433	895,974	1,901,697	70,916	3,173,504	163,140	6,222,561	71.80	2,441,872	2,188,640	1,954,742	—192,512
	7 mos.	1,125	54,432,486	6,067,335	63,742,277	5,020,931	13,001,181	554,773	22,745,442	1,049,471	42,506,402	66.70	21,235,875	19,380,923	17,893,050	5,390,276
Atlantic City	July	170	132,800	574,078	725,807	66,006	53,157	5,499	278,028	4,065	406,947	56.10	318,860	298,853	262,507	166,482
	7 mos.	170	864,470	1,664,132	2,630,734	421,031	279,918	40,502	1,501,992	35,246	2,278,317	86.60	352,417	212,149	—24,193	33,999
Perkiomen	July	41	89,278	9,886	102,246	8,749	4,645	106	46,069	1,029	60,634	59.30	41,612	35,452	29,186	57,341
	7 mos.	41	567,407	49,937	642,900	52,632	28,780	756	302,768	5,898	391,059	60.80	251,841	207,421	173,152	237,714
Port Reading	July	21	149,296	.....	159,085	26,371	41,416	229	72,882	3,643	144,541	72.60	54,544	40,804	20,465	—75,020
	7 mos.	21	1,316,473	.....	1,712,296	129,512	87,664	1,603	625,296	16,592	860,662	50.30	851,634	755,532	311,160	—7,769
Pittsburg & Shawmut	July	102	94,154	3,167	100,469	22,138	45,788	1,245	33,697	6,453	109,321	108.80	—8,852	—16,548	22,507	—21,528
	7 mos.	102	757,851	35,261	812,377	150,278	333,105	11,042	298,783	44,739	837,947	103.10	—25,570	—34,100	226,039	—58,393
Pittsburg & West Virginia	July	89	262,994	9,848	305,187	50,683	109,495	3,085	83,385	13,936	268,621	88.00	36,566	439	83,700	51,149
	7 mos.	89	1,833,914	65,001	2,122,128	257,231	635,196	23,266	574,471	104,480	1,660,093	78.20	462,035	181,337	782,695	429,919
Pittsburg, Shawmut & Northern	July	210	95,431	4,328	102,862	35,276	41,930	1,335	45,931	6,526	130,998	127.30	—28,136	—30,524	—18,184	—77,622
	7 mos.	210	798,929	46,890	867,829	206,732	285,804	12,154	373,672	45,797	924,159	106.40	—56,330	—73,276	58,274	—217,227
Quincy, Omaha & Kansas City	July	250	58,823	20,726	88,857	34,492	27,059	830	42,940	2,687	108,112	121.70	—19,255	—22,738	—28,504	—17,525
	7 mos.	250	531,084	150,367	740,350	269,533	160,282	5,806	391,288	16,676	841,879	113.70	—101,529	—132,795	—178,090	—86,182
Richmond, Fredericksb'g & Potomac	July	117	506,918	308,989	939,433	98,627	140,269	7,620	335,031	31,784	628,629	66.90	310,804	254,380	215,456	252,206
	7 mos.	117	3,729,132	2,502,856	7,404,223	672,060	1,013,820	60,047	2,614,172	206,588	4,716,439	63.70	2,687,784	2,268,877	1,821,925	1,463,050
Rutland	July	413	302,733	143,810	571,522	122,446	109,845	9,082	213,468	12,640	469,279	82.10	102,243	75,201	77,201	80,030
	7 mos.	413	2,308,875	841,890	3,897,861	681,639	723,744	59,623	1,737,986	88,238	3,302,151	84.70	595,710	428,061	492,325	209,370
St. Louis-San Francisco	July	4,751	4,881,051	1,795,172	7,201,236	1,117,789	1,543,600	102,564	2,455,466	199,600	5,385,492	74.80	1,815,744	1,511,882	1,453,686	1,357,118
	7 mos.	4,751	34,043,475	11,199,404	48,921,963	5,889,348	9,904,597	648,191	18,104,698	1,346,893	35,608,779	72.80	13,313,184	11,009,183	10,642,253	9,826,074
Ft. Worth & Rio Grande	July	235	102,572	27,487	140,170	34,243	27,007	3,202	62,084	5,902	132,439	94.50	7,731	3,988	—4,666	—5,390
	7 mos.	235	565,762	183,032	815,905	195,225	175,142	21,592	408,328	41,544	833,230	102.10	—17,325	—45,069	—104,511	—220,840
St. Louis, San Francisco & Texas	July	134	137,440	15,692	157,490	35,212	25,154	3,515	55,538	5,917	125,015	79.40	32,475	30,382	8,994	15,707
	7 mos.	134	754,072	96,063	890,499	210,285	156,554	26,474	382,285	54,461	819,374	92.00	71,125	56,099	—89,763	—83,818
St. Louis Southwestern	July	968	1,314,403	173,391	1,560,510	176,591	295,335	43,043	381,064	51,626	957,607	61.40	602,903	491,520	472,045	439,534
	7 mos.	968	10,326,984	1,093,938	12,006,682	1,346,411	2,273,925	304,502	3,119,079	366,351	7,472,986	62.20	4,533,696	3,895,755	3,522,453	2,868,627
St. Louis Southwestern of Texas	July	807	539,355	111,050	701,166	135,297	219,462	20,079	277,690	28,951	681,902	97.30	19,264	—8,306	9,794	—7,521
	7 mos.	807	3,412,271	698,128	4,436,900	966,604	1,697,493	141,935	2,284,845	217,207	5,305,524	119.60	—868,624	—1,058,541	—917,813	—886,606
San Antonio & Aransas Pass	July	739	362,490	81,891	477,385	81,168	128,047	11,049	179,953	21,157	419,517	87.90	57,868	42,618	36,896	60,298
	7 mos.	739	2,241,151	455,568	2,929,201	686,420	880,147	75,629	1,269,587	163,399	3,065,795	104.70	—136,594	—245,789	—185,761	—292,093
San Antonio, Uvalde & Gulf	July	317	76,044	19,150	101,755	14,074	12,556	3,700	39,527	6,461	76,318	75.00	25,437	22,235	14,117	13,965
	7 mos.	317	514,635	121,445	698,825	106,830	97,403	26,429	284,819	69,917	585,110	83.70	113,715	90,237	26,970	29,329
Seaboard Air Line	July	3,577	2,489,907	784,274	3,685,998	417,462	631,038	115,918	1,473,288	166,202	2,832,791	76.90	853,207	677,755	632,597	325,958
	7 mos.	3,576	21,503,917	6,023,277	30,601,343	3,828,162	5,320,507	979,318	12,291,177	1,170,773	23,859,199	78.00	6,742,144	5,511,555	4,134,223	2,356,995
Southern Ry.	July	6,971	8,282,617	3,084,703	12,214,076	1,729,923	2,574,530	234,344	4,336,793	326,639	9,285,705	76.00	2,928,371	2,306,533	2,033,998	1,201,190
	7 mos.	6,971	61,372,335	19,007,409	86,663,046	11,933,916	16,474,812	1,595,229	32,464,100	2,214,604	65,293,067	75.30	21,369,979	17,459,001	15,466,476	10,078,616
Alabama Great Southern	July	318	621,920	216,288	886,484	110,310	194,135	20,746	278,462	23,267	633,347	71.40	253,137	204,593	197,625	—106,572
	7 mos.	318	4,747,599	1,186,743	6,279,398	735,902	1,174,065	142,279	2,081,115	168,560	4,342,041	69.10	1,937,357	1,564,062	1,542,507	884,042
Cincin., New Orleans & Tex. Pac.	July	338	1,376,550	412,224	1,869,017	329,878	431,881	36,675	588,932	44,903	1,443,149	77.20	425,868	342,289	291,206	—50,867
	7 mos.	338	10,600,533	2,527,170	13,732,288	1,705,991	3,022,356	243,841	4,295,024	321,692	9,666,170	70.40	4,066,118	3,364,947	2,906,209	1,535,137
Georgia, Southern & Florida	July	402	288,288	110,116	429,991	70,914	82,342	9,293	177,950	11,717	354,035	82.30	75,956	56,327	33,559	11,599
	7 mos.	402	2,018,289	792,122	3,051,489	486,182	501,756	62,154	1,248,529	79,546	2,398,422	78.60	653,067	513,760	299,246	198,839
New Orleans Northeastern	July	207	385,629	101,835	544,186	79,891	130,388	10,841	190,622	15,030	430,878	79.20	113,308	63,015	49,428	—122,666
	7 mos.	207	3,035,180	597,564	4,049,167	559,184	790,497	75,559	1,481,659	107,069	3,039,571	75.10	1,009,596	650,508	585,552	111,293
Northern Alabama	July	110	120,622	15,027	138,725	12,787	6,999	2,155	53,968	3,031	78,940	56.90	59,785	52,768	23,049	14,385
	7 mos.	110	866,852	91,010	978,159	152,327	45,053	14,486	343,236	23,595	578,697	59.20	399,462	351,426	188,517	84,483
Southern Pacific	July	7,131	11,980,562	4,250,900	17,856,151	2,327,875	2,881,052	289,082	5,848,312	453,562	12,123,587	67.90	5,732,564	4,448,382	4,110,343	3,718,166
	7 mos.	7,119	74,319,861	26,386,800	111,659,847	15,436,916	19,866,682	1,926,733	36,409,092	3,238,288	78,788,983	70.60	32,870,864	23,942,822	22,588,081	17,190,950
Arizona Eastern	July	382	258,991	24,971	296,528	45,354	52,855	3,129	75,811	18,983	197,247	66.50	99,281	74,840	68,905	64,914
	7 mos.	382	1,826,856	205,871	2,143,234	281,680	336,337	21,386	535,346	129,125	1,311,836	61.20	831,398	660,914	604,940	434,017
Atlantic Steamship Lines	July	.....	967,534	74,024	1,085,043	12,985	168,542	21,807	637,739	25,101	866,174	79.80	218,869	200,571	58,980	
	7 mos.	.....	7,119,355	433,029	7,903,963	101,895	1,179,881	150,518	4,753,302	194,373	6,379,969	80.70	1,523,994	1,437,098	1,436,708	1,085,112

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Galv't'n, Harrisb'g & San Antonio.	July	1,379	$1,282,105	$426,102	$1,810,726	$360,334	$394,544	$43,945	$754,990	$69,857	$1,631,347	90.10	$179,379	$99,437	$77,535	$93,435
	7 mos.	1,379	9,093,551	2,892,556	12,750,641	2,693,827	2,719,091	301,444	5,126,452	495,274	11,329,521	88.90	1,421,120	978,899	745,953	1,045,645
Houston & Texas Central	July	923	828,946	282,571	1,175,555	242,702	239,942	25,056	407,754	43,753	956,805	81.40	218,750	165,808	128,142	117,759
	7 mos.	923	5,294,329	1,796,893	7,601,575	1,708,473	1,706,659	177,744	2,880,855	321,497	6,780,687	89.20	820,888	479,245	214,580	981,645
Houston, East & West Texas	July	191	196,220	49,861	259,394	56,067	58,526	4,228	84,491	8,648	211,912	81.70	47,482	37,084	28,702	37,734
	7 mos.	191	1,265,646	307,026	1,664,493	398,417	403,188	25,117	649,830	61,465	1,534,681	92.20	129,812	65,977	—12,748	89,887
Louisiana Western	July	207	227,406	102,649	351,325	61,238	71,879	10,527	110,756	16,622	274,679	78.20	76,646	76,692	89,103	16,132
	7 mos.	207	1,840,503	630,448	2,647,227	442,532	506,378	68,736	783,656	118,129	1,946,533	73.50	700,694	518,017	524,564	380,502
Morgan's L. & T. R. R. & S. S. Co.	July	400	434,936	168,811	653,672	154,874	157,916	16,501	277,963	30,586	642,153	98.20	11,519	—35,085	—40,522	—112,225
	7 mos.	400	3,546,085	1,090,513	5,030,960	1,147,245	1,098,116	115,095	2,008,520	217,374	4,601,010	91.50	429,950	105,691	—49,798	—256,273
Texas & New Orleans	July	507	510,786	174,572	727,638	182,825	169,450	13,061	257,642	25,113	651,078	89.50	76,560	38,097	26,124	—126,519
	7 mos.	507	3,605,633	1,120,726	5,062,027	1,328,858	1,212,028	90,777	1,841,627	178,543	4,672,805	92.30	389,222	178,478	61,476	46,846
Spokane International	July	165	68,170	17,804	91,032	17,856	11,437	3,244	34,828	5,351	73,524	80.80	17,508	11,642	4,959	17,633
	7 mos.	165	521,646	114,828	673,693	102,918	75,447	22,602	257,243	40,744	504,621	74.90	169,072	128,255	74,884	86,426
Spokane, Portland & Seattle	July	554	373,324	215,860	649,578	83,514	115,659	12,078	207,001	16,995	445,978	68.70	203,600	128,597	113,832	133,295
	7 mos.	554	3,049,031	997,007	4,464,101	542,291	788,246	69,800	1,386,926	122,742	2,991,483	67.00	1,472,618	947,115	822,933	750,164
Tennessee Central	July	287	184,294	52,639	248,966	46,299	45,162	6,010	90,874	9,806	198,122	79.60	50,844	42,771	24,302	—2,549
	7 mos.	287	1,397,534	305,663	1,796,425	280,962	303,538	41,594	685,009	68,198	1,378,746	76.70	417,679	375,951	245,172	77,095
Terminal R. R. Asso. of St. Louis	July	37	.....	.....	423,108	93,240	33,055	936	134,061	9,342	274,160	64.80	148,948	88,771	185,845	162,588
	7 mos.	37	.....	.....	2,922,626	620,080	263,841	6,870	972,598	53,226	1,941,336	66.40	981,290	544,782	1,354,782	1,346,304
East St. Louis Connecting	July	1	.....	.....	184,459	13,504	8,956	268	60,729	3,575	87,032	47.20	97,427	87,664	66,540	63,992
	7 mos.	1	.....	.....	1,358,314	86,347	40,225	1,962	443,192	18,976	590,702	43.50	767,612	672,393	533,500	470,695
St. L. Merchants' Bridge Term.	July	9	.....	.....	366,637	40,344	25,017	864	167,344	6,057	239,626	65.40	127,011	101,995	100,955	39,782
	7 mos.	9	.....	.....	2,839,832	306,485	194,641	6,316	1,324,069	48,602	1,880,113	66.20	959,719	744,134	703,617	550,857
St. Louis Transfer Ry.	July	6	.....	.....	68,886	6,728	4,442	156	34,273	2,020	47,619	69.10	21,267	20,871	14,626	—1,729
	7 mos.	6	.....	.....	486,370	35,824	27,167	1,141	258,586	9,875	332,593	68.40	153,777	151,066	107,982	23,238
Texas & Pacific	July	1,952	1,678,909	595,166	2,463,006	406,831	538,965	52,995	861,951	81,311	1,960,966	79.60	502,040	401,236	391,002	388,011
	7 mos.	1,952	11,941,705	4,076,706	17,426,013	2,531,248	4,561,196	353,694	6,648,648	637,351	14,849,288	85.20	2,576,725	1,861,562	1,219,480	1,568,317
Toledo, Peoria & Western	July	247	100,983	34,876	151,255	32,653	43,804	2,158	76,491	8,505	163,611	108.20	—12,356	—23,366	—26,284	—12,484
	7 mos.	247	661,085	291,406	1,051,528	200,095	334,852	17,744	543,150	52,923	1,148,696	109.20	—97,168	—174,312	—152,238	—132,562
Toledo, St. Louis & Western	July	Included in the New York, Chicago & St. Louis										.....	.....	.....	.....	.....
	7 mos.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Trinity & Brazos Valley	July	368	316,154	20,402	341,000	36,816	49,240	3,031	95,871	13,520	198,114	58.10	142,886	135,373	123,505	—1,104
	7 mos.	368	963,719	116,755	1,113,842	217,734	236,102	22,634	460,265	79,341	1,010,596	90.70	103,246	54,231	—56,446	—148,577
Ulster & Delaware	July	128	86,345	105,574	231,032	24,032	23,020	5,475	99,371	8,623	160,521	69.40	70,511	64,508	52,894	45,673
	7 mos.	128	512,931	250,643	1,023,164	131,015	162,176	19,960	489,561	56,203	859,858	84.00	163,306	121,276	81,947	30,100
Union R. R. of Penna.	July	45	.....	.....	1,255,666	68,977	322,920	178	487,574	8,458	888,107	70.70	367,559	285,561	367,313	545,354
	7 mos.	45	.....	.....	7,239,183	440,920	1,562,903	1,224	3,360,524	54,429	5,419,944	74.90	1,819,239	1,467,116	2,099,384	2,224,512
Union Pacific	July	3,708	6,712,048	1,714,239	9,345,356	1,567,517	2,041,949	157,425	2,732,430	258,331	6,993,838	74.80	2,351,518	1,758,781	1,394,458	1,999,080
	7 mos.	3,708	44,612,005	10,050,018	60,303,793	7,871,665	13,655,652	1,041,091	17,942,746	1,859,411	43,598,342	72.30	16,705,451	12,725,720	12,433,933	11,532,079
Oregon Short Line	July	2,366	1,994,684	592,764	2,847,165	634,528	574,032	47,483	917,165	105,125	2,356,184	82.80	490,981	239,113	120,424	292,983
	7 mos.	2,366	15,613,784	3,113,560	20,264,252	3,514,313	4,215,308	315,666	6,583,416	748,338	15,786,428	77.90	4,477,824	2,712,602	2,387,820	2,450,431
Oregon, Wash. R. R. & Nav. Co.	July	2,238	1,424,831	542,657	2,186,737	565,310	440,302	71,681	937,578	115,305	2,162,755	98.90	23,982	—153,885	—304,888	—96,900
	7 mos.	2,237	10,920,374	3,222,680	15,566,192	3,267,658	3,028,188	442,417	6,957,604	813,528	14,662,115	94.20	904,077	—286,278	—868,268	—1,259,694
St. Joseph & Grand Island	July	258	181,479	23,618	225,523	64,750	65,021	2,393	101,454	13,083	246,701	109.40	—21,178	—34,308	—60,395	—8,579
	7 mos.	258	1,502,895	173,183	1,796,380	331,906	376,068	17,528	805,203	85,941	1,618,252	90.10	178,128	85,736	—20,487	30,536
Utah	July	102	118,629	459	119,840	34,722	31,636	365	33,624	4,748	104,531	87.20	15,309	8,860	—3,701	37,964
	7 mos.	102	847,106	4,109	857,345	153,257	256,301	2,500	239,706	36,730	687,529	80.20	169,816	122,993	77,228	161,953
Virginian	July	540	1,621,916	88,497	1,830,238	178,246	507,118	11,810	464,316	43,587	1,204,214	65.80	626,024	518,294	547,107	404,219
	7 mos.	540	11,623,793	522,329	12,962,574	1,209,022	2,884,847	81,962	3,396,020	255,287	7,832,541	60.70	5,070,033	4,348,705	4,610,345	4,237,441
Wabash	July	2,472	4,031,325	932,368	5,426,251	876,711	1,158,654	140,885	2,023,257	151,364	4,375,878	80.60	1,050,373	861,555	633,295	532,868
	7 mos.	2,472	28,948,548	5,336,553	37,210,386	5,071,970	7,933,465	853,953	14,283,653	1,071,729	29,369,824	78.90	7,840,562	6,504,506	4,778,053	2,963,305
Western Maryland	July	804	1,815,093	104,492	2,005,106	272,694	519,987	37,499	642,086	42,557	1,528,715	76.20	476,391	386,391	406,083	260,449
	7 mos.	804	12,491,703	547,452	13,736,046	1,592,641	3,619,270	251,738	4,807,693	310,955	10,705,635	77.90	3,030,411	2,475,411	2,676,766	1,748,526
Western Pacific	July	1,043	882,909	279,307	1,294,883	243,139	204,717	40,090	432,813	36,249	1,004,378	77.60	290,505	208,718	210,191	172,327
	7 mos.	1,043	5,269,696	1,295,637	7,176,695	1,179,920	1,381,753	244,137	2,575,622	239,935	5,769,316	80.40	1,407,379	859,421	1,214,627	457,038
Wheeling & Lake Erie	July	511	1,639,025	73,233	1,853,696	299,782	532,878	18,409	543,182	38,799	1,437,573	77.60	416,123	292,388	243,949	121,982
	7 mos.	511	9,281,896	427,256	10,520,831	1,225,296	3,192,626	110,703	3,451,687	247,448	8,251,567	78.40	2,269,264	1,501,013	1,238,324	1,054,123

Number of Railroad Stockholders Increases

An increase of 24,165 in the number of stockholders of Class I railroads for the year 1922 as compared with 1921 is shown in the preliminary abstract of statistics of common carriers just issued by the Interstate Commerce Commission. The total as of December 31, 1922, was 777,132, including 348,575 in the eastern district, 74,699 in the southern district and 353,858 in the western district. The report shows a total of $65,400,734 par value of stock actually issued during the year and $462,325,709 par value of funded debt actually issued during the year. The net increase in investment in road and equipment during the year is shown as $302,106,786. Expenditures for new lines and extensions amounted to $48,551,339 and expenditures for additions and betterments to $418,870,780, but credits for property retired amounted to $140,205,192 and adjustments to $25,110,141.

Revenues and Expenses for July

The Interstate Commerce Commission's summary of revenues and expenses for Class I roads for July and seven months of 1923 is as follows:

	Item	July 1923	July 1922	Seven Months 1923	Seven Months 1922
1	Aver. number of miles operated ..	235,677.52	235,799.31	235,765.08	235,758.49
	Revenues:				
2	Freight	$379,047,541	$299,565,951	$2,650,007,186	$2,166,330,577
3	Passenger	[1]107,518,690	[2]100,694,209	[3]646,740,965	[4]603,731,255
4	Mail	7,591,426	7,182,737	53,109,499	51,901,595
5	Express	11,612,155	10,444,507	89,026,223	68,906,858
6	All other trans'pn	16,850,475	15,142,370	113,557,243	100,083,572
7	Incidental	12,566,168	10,167,025	76,052,036	62,321,514
8	Joint facility—Cr	840,968	814,353	5,795,556	5,905,669
9	Joint facility—Dr	213,807	170,988	1,552,354	1,211,976
10	Ry. op'tng revs.	535,813,616	443,840,164	3,632,736,354	3,057,969,064
	Expenses:				
11	Main. of way and structures	76,461,700	65,616,403	451,891,161	412,120,510
12	Main. of equip..	121,635,305	78,693,449	853,301,873	669,945,296
13	Traffic	7,983,585	7,606,726	53,842,126	50,508,405
14	Transportation ..	191,544,827	172,755,915	1,383,134,168	1,173,344,482
15	Misc. operations.	4,576,554	4,184,649	29,048,187	26,971,446
16	General	13,402,329	12,869,034	93,827,590	91,924,074
17	Transp'tn for investment—Cr. ..	1,084,332	644,985	5,465,470	3,428,429
18	Ry. op'tng exp..	414,519,968	341,081,191	2,859,579,635	2,421,385,784
19	Net rev. from railway operations...	121,293,648	102,758,973	773,156,719	636,583,280
20	Ry. tax accruals..	28,558,741	26,283,072	188,845,187	174,531,058
21	Uncol. ry. revs...	117,694	111,037	923,053	769,634
22	Ry. op'tng income	92,617,213	76,364,864	583,388,479	461,282,588
23	Equip. rents—Dr. balance	5,910,527	5,224,978	42,481,702	32,288,533
24	Joint facility rent —Dr. balance....	2,091,741	1,819,358	12,567,556	10,406,411
25	Net ry. operating income	84,614,945	69,320,528	528,339,221	418,587,644
26	Ratio of expenses to rev. (per cent)	77.36	76.85	78.72	79.18

[1]Includes $3,236,539, sleeping and parlor car surcharge
[2]Includes $2,953,419, sleeping and parlor car surcharge.
[3]Includes $20,562,676, sleeping and parlor car surcharge.
[4]Includes $17,976,483, sleeping and parlor car surcharge.

Automobile Wrecks on the Pennsylvania

Accidents at highway crossings on the Pennsylvania Railroad more than doubled during July as compared with the corresponding month of 1922. In July, 1923, 46 persons were killed and 39 injured, as compared with 21 killed and 35 injured in July, 1922. Investigation shows that many persons are driving motor cars who are not only helpless in emergencies, but also totally fail to realize their responsibility for protecting the persons who ride with them. It is frequently seen that automobiles and trucks are filled to capacity and the drivers are so crowded that access to the brakes and gear shift lever is impeded; and when an emergency arises, a crash is likely to occur. A number of shocking cases are reported; for example the following: An automobile, occupied by eight persons, running 35 miles an hour, ran into the side of a locomotive standing on a crossing, all the occupants being injured. An automobile, occupied by four persons, was driven against the twenty-fourth car of a freight train, killing three and seriously injuring the other. An automobile, occupied by the driver and four men companions, was driven into the side of a freight train standing on a crossing. The driver was arrested for driving while intoxicated. The driver of a motor truck attempted to drive across tracks ahead of a passenger train after other automobiles had stopped. The truck was struck, one person being killed and one injured.

Western Railway Club Opens the Season

The first Fall meeting of the Western Railway Club was held Monday evening, September 17, at the Auditorium Hotel, Chicago, with President Hal. S. Ray (Rock Island) in the chair. President Ray made a brief opening address, outlining the objects of the club and then throwing the meeting open to a discussion of the program for the ensuing year. From the enthusiastic and general response in the way of suggestions, it is plain that an interesting and constructive program of meetings will be arranged, with strong emphasis on problems of personnel and public relations. Some of the members, however, felt that these problems should not be considered to the exclusion of railroad mechanical, electrical and other department problems. It was voted to begin the monthly meetings promptly at 8 p. m., adjourning at 9:30 p. m. for a buffet luncheon and get-together meeting.

Transportation Conditions Improving in Japan

T. Hattori, resident representative of the Japanese Government Railways, New York City, on September 12 received the following cablegram from Japan:

"After the earthquake, the head office and official residences were burned down, but the business is being conducted in the Tokio station building, where the Tokio Region is located, and which escaped disaster. Railroad and buildings between Tokio, Yokohama and Odawara have been seriously damaged, and many railway officials and employees were found among the sufferers, but the higher officials are safe. Trains are partly running in the stricken area and railway officials are doing their best for the transportation of food and material for the work of reconstruction."

New Demands for Higher Pay

After several weeks of comparative quiet, wage increase petitions are again pouring in on the Railroad Labor Board. The American Train Dispatchers' Association has petitioned the board for rates of $335 a month for assistant chief dispatchers and $300 a month for trick dispatchers on the Great Northern. The Brotherhood of Railway and Steamship Clerks has appealed to the board for advances ranging from 9 to 13 cents an hour for the clerical employees it represents on the Chicago, Rock Island & Pacific, and for 10 cents an hour for freight handlers and station employees on the Richmond, Fredericksburg & Potomac. Adjustments of the wage rates of telegraphers on the Texas & Pacific have been asked by the Order of Railroad Telegraphers, these adjustments being, for the most part, wage increases for certain of the employees who are now receiving alleged disproportionate wages. Signalmen employed by the Chicago, Indianapolis & Louisville and the Washington Terminal, through the Brotherhood of Railroad Signalmen, have applied for new wage rates ranging from 60 cents an hour for helpers to $1 an hour for gang foremen. Crossing watchmen on the Boston & Maine have also asked for increases.

In two decisions recently announced, the Labor Board has upheld the train and engine service employees on the Arizona Eastern in two controversies between the road and the employees. The first decision recognizes the claim of the men for back pay to the amount of a wage reduction put into effect on January 1, 1922, in violation of the Labor Board's orders. The second decision upheld the employees in their protest against the elimination of time and one-half for overtime placed in effect on July 1, 1921, as well as a claim for back pay for the period of time during which the rule has been suspended.

Mechanical department employees on the Maine Central and the Portland Terminal have been granted wage increases amounting to $58,000 annually. Machinists, boilermakers, blacksmiths, electricians, sheet metal workers, carmen and helpers with over one year of service have received an increase of three cents an hour, helpers with less than one year of service, one cent an hour and car cleaners, 1½ cents an hour.

Traffic News

The Great Northern has transported 10,000,000 tons of iron ore, so far, during 1923, compared with a total of 9,943,000 tons during 1922.

The Great Northern is assisting farmers in North Dakota by distributing 3,000 head of breeding ewes among the farmers in the vicinity of Petersburg.

The movement of peaches and grapes from the Chicago-Petoskey division of the Pere Marquette has begun, and the daily average for the first week was 21 carloads of peaches and 13 of grapes.

The Indiana Public Service Commission has ordered reductions in freight rates on logs amounting to from ½ cent to 3 cents per 100 lb. on all railroads in Indiana. The decision is on a complaint filed two years ago by the Southern Hardwood Traffic Association.

According to A. C. Johnson, vice-president of the Chicago & North Western, South Dakota this year will produce 129,896,000 bu. of corn, 26,566,000 bu. of wheat, 87,861,000 bu. of oats, 22,800,000 bu. of barley and 18,730 bu. of white potatoes.

The Jefferson Southwestern Illinois, a new railroad 11 miles long connecting Mount Vernon, Ill., and Nason, was completed on September 14 and the first train was operated over the line on that date. Nason is the site of a large coal mine which will be put into operation in November.

The Duluth, Missabe & Northern has been granted permission by the Railroad and Warehouse Commission of Minnesota to discontinue the operation of four trains between Duluth and Virginia, and between Sharon and Sherwood. The trains between Duluth and Virginia are discontinued because of bus and street car competition. The revenue on the other trains was less than the cost of operation.

The three railroads centering in Boston have filed with the Massachusetts Department of Public Utilities tariffs providing for an increase, beginning October 15, of 20 per cent in the prices of monthly and other commutation tickets to and from all points in Massachusetts. Protests from civic organizations and many citizens began to pour in upon the state commissioners as soon as the announcement became public.

Net ton miles of freight handled by the railroads in July amounted to 38,513,263,000, according to a compilation made by the Bureau of Railway Economics from reports made by Class I roads. This represents an increase of 42 per cent as compared with the net ton miles handled in July last year when traffic was reduced somewhat by the strikes of both coal miners and railway shopmen, but the figure was exceeded by approximately 5 per cent

The recently completed portion of the Wyoming North & South, from Casper, Wyo., north to Salt Creek, 40 miles, was opened for business on September 15, according to an announcement from the Middle States Oil Corporation, which is constructing the road. This will provide transportation facilities for the Poison Spider, North Casper Creek, Teapot Dome and Salt Creek oil fields, which hitherto have been without railroad service.

The Railroad and Warehouse Commission of Minnesota has ruled that for shipments within the state of Minnesota the arbitrary minimum weight on hogs in single deck cars will be unreasonable and excessive when it exceeds 16,500 lb. in cars 36 ft. 7 in. and under, 18,500 lb. in cars over 36 ft. 7 in. to and including 40 ft., 18,500 lb. in cars over 40 ft. to and including 40 ft. 6 in., and 20,500 lb. in cars over 40 ft. 6 in. Exceptions in tariffs now on file covering cars 30 ft. 7 in. and under in length are to remain in effect.

The Northern Pacific has been granted permission by the Railroad and Warehouse Commission of Minnesota to discontinue the operation of 36 daily passenger trains between St. Paul and Minneapolis (10 miles) and to substitute a time-table requiring only 30 trains daily. The cost of operation, including taxes, for May, 1923, was $23,019, while the passenger revenue was $9,220, causing a loss for the month of $13,799. The total expenditure of the road for wages of trainmen and enginemen and for fuel for these trains in May amounted to $12,056.

The World's Dairy Congress Association has been notified that the Trunk Line, the Central Passenger and the Southeastern Passenger Associations will sell round trip tickets at 80 per cent of regular rates, to the World's Dairy Congress. From the South the special arrangement allows stop overs at Washington, where the Congress sessions will be held on October 2 and 3, at Philadelphia, where the delegates will meet October 4, and at Syracuse, N. Y., where the concluding sessions will be held from October 5 to 10, in co-operation with the National Dairy Exposition.

The New York, New Haven & Hartford has announced in Connecticut and Rhode Island new tariffs, making advances in commutation passenger rates, similar to those published in Massachusetts; all to go into effect on October 15. In Connecticut it appears that under the present arrangement, commutation tickets good for three months are sold at rates much lower than those for one month; and in the new tariffs the three-month tickets are omitted, so that for passengers who have used these the proposed advance will be about 100 per cent.

At a meeting on September 10 the Traffic Study Club of Akron, Ohio, elected H. L. Sovacool, president of the Akron, Canton & Youngstown, president; W. R. Garrison of the Union Fireproof Warehouse & Storage Company, vice-president; and J. J. King, of the Akron, Canton & Youngstown, secretary and treasurer. Directors elected were: C. O. Taylor of the Akron, Canton & Youngstown; U. E. Kuntz of the Goodyear Tire & Rubber Company; E. F. Malaney of the Robinson Clay Products Company; P. G. Whitmore of the Pennsylvania Railroad and J. Sweeney of the M. O'Neil Company.

The Interstate Commerce Commission has cited the parties of record in the express rate advance case to show cause by October 15 why a petition of the American Railway Express Company and the Southeastern Express Company calling attention to a recent increase in wages of express employees should not be included in the record in this case without further hearing. The express companies in their petition stated that the Labor Board had awarded an increase in wages which would add $6,000,000 annually to the expenses of the American Railway Express Company and $150,000 annually to those of the Southeastern company. The commission says that unless good cause shall appear, the petition will be included without further hearing.

The expansion of traffic on the lakes, rivers and canals of the country, as a factor in the solution of the general problem of transportation, was considered by the Committee on the Development of Waterways and the Co-ordination of rail and waterway service which met on September 11 in the board room of the Chamber of Commerce of the United States at Washington. The committee met as a part of the National Transportation Conference created by the Chamber to study the transportation question. The committee, one of five designated by the president of the National Chamber, to consider different aspects of the transportation problem, is composed of representatives of various interests. W. L. Clause, of the Pittsburgh Plate Glass Company, is chairman and among the others are Dr. Emory R. Johnson, University of Pennsylvania; C. H. Markham, president, Illinois Central Railroad, and T. C. Powell, vice-president, Erie Railroad. The committee will soon issue its report, which, with the reports of the other four committees will form the basis of discussion for the general transportation conference soon to be held in Washington.

Assigned Car Order Again Postponed

The Interstate Commerce Commission has again postponed, to November 1, the effective date of its order abolishing assigned cars and regulating the use of privately owned cars for bituminous fuel loading. The order was originally made effective on September 1, and after numerous protests and petitions for rehear-

ing it was modified to become effective on October 1. No decision has yet been announced as to whether the commission will reopen the case for further hearing.

Traffic League Officers Endorse Regional Boards

At a recent meeting in Chicago the executive committee of the National Industrial Traffic League adopted the following resolution:

"Resolved, That it is the sense of the executive committee of The National Industrial Traffic League, that the League should give its wholehearted approval to the organization by the Car Service Division of the American Railway Association, of the regional shippers' advisory boards in the various sections of the country, and that the members of the League be urged to give their co-operation and support in the interest of better transportation for all; and, be it further

"Resolved, That Mr. Donald D. Conn, director of public relations, Car Service Division, American Railway Association, be commended for his conception of this plan, and his untiring efforts in carrying same into successful operation."

Anthracite Shipments in August

The shipments of anthracite for the month of August, 1923, as reported to the Anthracite Bureau of Information, Philadelphia, amounted to 6,672,855 gross tons as compared with 6,260,053 tons during July, an increase of 412,802 tons or 6.6 per cent. In August, 1921, 5,575,115 tons were shipped to market, an increase of 1,097,740 tons is recorded, or 19.7 per cent. The shipments last month established another record for August, which was only exceeded during that month in the years 1917 and 1918, when maximum shipments of over 7,000,000 tons were made.

Shipments by originating carriers were as follows:

	August, 1923	August, 1921	July, 1923
Philadelphia & Reading	1,277,770	1,116,844	1,155,701
Lehigh Valley	1,154,004	924,649	1,124,400
Central of N. J.	496,725	544,007	494,254
Dela., Lackawanna & West.	1,004,507	953,014	965,446
Delaware & Hudson	943,143	756,982	879,772
Pennsylvania	555,064	360,817	520,423
Erie	759,711	628,280	661,120
N. Y., Ontario & W.	154,586	98,355	152,543
Lehigh & New England	327,345	192,167	306,394
Total	6,672,855	5,575,115	6,260,053

Motor Trucks on Massachusetts Highways

The proper regulation of the use of motor trucks on the highways was the subject of discussion at a hearing in Boston on September 12 before the Massachusetts Department of Public Works, that department having been directed by the legislature of the State, some months ago, to make a general investigation.

The facts brought out by the several speakers were largely those with which the reader is already familiar. One of them was that some of the highways being built by the State of Massachusetts cost $60,000 a mile. The cost of highway bridges also is much greater than under former conditions. Commercial vehicles in Massachusetts constitute about one-seventh of the total number of automobiles and pay about one-fourth of the fees. Spokesmen for the automobile industry protested against the "double taxation" embodied in the automobile fee system. Vehicle owners in Massachusetts have this year already paid into the state treasury more than $6,000,000. It was claimed that a larger share of the taxes should be put upon the owners of adjacent real estate, the value of which in many cases has been doubled and trebled by the construction of better highways. Over-taxation of automobile common carriers will drive them out of business; but this would not settle the road problem, for manufacturers then would provide their own trucks; and, not being common carriers, they could not be regulated. There appears to be already a good deal of competition, not alone with railroads, but between the trucks themselves. One speaker said that they "swarm on the highways, cut rates, and make no money."

A representative of the Mack Motor Truck Company said that, notwithstanding the statements that truck operators were suffering from competition, those who bought trucks from his company were good pay.

One truck proprietor complained that the State itself, through its contractors working on road construction, was using the heaviest trucks of all, some of them carrying 16 tons.

Commissioner William F. Williams, who presided at the hearing, announced that he would appoint a committee to give further consideration to the subject. He proposes to ask the railroads, the interurban railways and the motor associations to nominate members for this committee.

Hearings on New York Port Authority Issue

The Port of New York Authority, a board of commissioners acting under the joint authority of the States of New York and New Jersey, established to improve the terminal facilities of the city and harbor, having had difficulty in securing satisfactory responses from the railroads concerning plans for improvements on the New Jersey side of the Hudson river, some time since called for an investigation by the Interstate Commerce Commission; and in New York City, this week, the commission, represented by Commissioners Aitchison, Potter and Cox, joining with the Port Authority, held a joint hearing, leading railroad officers having been summoned to appear. E. H. Outerbridge, chairman of the Port Authority, sat with Commissioner Aitchison.

One of the principal proposals of the Port Authority is its "Belt Line No. 13," a plan to unify the railroad tracks from Edgewater, N. J., on the north to Bayonne, N. J., on the south, a distance of about 12 miles, the tracks lying close to the river all of the way; and the principal discussion had to do with this line. It consists of freight tracks owned by the New York Central, the Delaware, Lackawanna & Western, the Hoboken Shore Railroad (owned by the United States Government), and other railroads. Spokesmen for these owning roads opposed the Port Authority's plan. They say that the railroads, by joint action, can conduct the freight transfer business over this territory to the satisfaction of the public simply by making a few inexpensive changes and by the appointment of a joint supervisor.

George W. Goethals, consulting engineer for the Port Authority, presented an outline of some of the proposals which have been formulated by the Port Authority, the execution of which, he estimated, would save $1,300,000 annually to the shipping public by the expenditure of only $700,000.

Samuel Rea, president of the Pennsylvania and A. H. Smith, president of the New York Central, gave brief statements of the railroads' attitude.

The railroads, represented by Robert J. Cary, general counsel of the New York Central, called upon the Port Authority to define its plans in detail so that the railroads could more clearly see what they are called upon to do; but this request was not granted. For themselves, the railroads handed up a copy of a resolution which had been adopted on September 11 by the executives of the Trunk lines, reading:

"Resolved, That it is the sense of this meeting that the traffic officials immediately canvass the question of switching tariffs, switching arrangements, or other means, for the direct movement of all carload freight to and from railroads within the so-called Belt Line 13 territory, so as to avoid unjustifiable back-hauling and circuitous routing or delays to the movement of carload traffic and the payment of unreasonable charges.

"That all interested railroads join in having a study made for the construction of a belt line on the west side of the Bergen Hills [farther from the Hudson River] from a point to be agreed upon on the south to a point to be agreed upon on the north, for the interchange of freight traffic between these lines, and to be operated for that purpose."

On the third day of the hearing (Wednesday, September 19) testimony was presented concerning delays and inefficiency under the present methods of transferring freight on the west side of the Hudson, and two railroad presidents were examined, Daniel Willard (B. & O.) and W. G. Besler (C. N. J.). The presidents expressed themselves as favorable to co-operation with the Port Authority, but in detail their views in favor of joint operation by the owning roads rather than by a state or neutral authority were about the same as those given by previous railroad speakers. Mr. Willard, commenting on the New York Central's proposal to make a new through line to the west through northern Pennsylvania, using the Central of New Jersey for the Eastern end and the New York Central via Ashtabula, observed that the line could be shortened 22 miles by using the Baltimore & Ohio from Butler, Pa., westward.

Equipment and Supplies

Locomotive Shipments

Department of Commerce reports based on returns from the principal manufacturing plants show that the builders made shipments in August of 272 locomotives as compared with 239 in July. In the first eight months of 1923, shipments totaled 1,916 as compared with 641 in the corresponding period of last year. At the end of August unfilled orders totaled 1,497 as compared with 1,738 at the end of July. The detailed figures showing the proportion of foreign and domestic business and giving comparisons with preceding periods follow:

	August, 1923	July, 1923	August, 1922	Eight months' total, January to August 1923	1922
Shipments:					
Domestic	259	211	130	1,802	472
Foreign	13	28	21	114	169
Total	272	239	151	1,916	641
Unfilled orders: (end of month):					
Domestic	1,406	1,652	926	...	...
Foreign	91	86	109	...	...
Total	1,497	1,738	1,035	...	...

Locomotives

THE NEW YORK CENTRAL has ordered 15 locomotive tenders from the Lima Locomotive Works, and also placed an order for 20 with the American Locomotive Company. These tenders are to have a capacity of 15,000 gal. and will have six-wheel trucks.

Freight Cars

THE NORTHERN PACIFIC is inquiring for 10 steel center sills.

THE CENTRAL RAILROAD OF BRAZIL is inquiring through the car builders for 100 gondola cars.

ARTHUR G. MCKEE & CO., Cleveland, Ohio, is inquiring for 12 ore cars of 75 tons' capacity for export.

THE DENVER & RIO GRANDE WESTERN is inquiring for 50 narrow gage refrigerator cars of 25 tons' capacity.

THE ELGIN, JOLIET & EASTERN, reported in the *Railway Age* of September 8 as inquiring for 500 steel underframes, has ordered this equipment from J. G. Heggie & Sons, Joliet, Ill.

THE CUBA CANE SUGAR CORPORATION has ordered 35 cane cars of 30 tons' capacity from the American Car & Foundry Co., and 25 cane cars of 15 tons' capacity from the Koppel Industrial Car & Equipment Company.

Passenger Cars

THE CENTRAL OF NEW JERSEY is inquiring for 50 coaches, 5 combination passenger and baggage cars and 10 baggage cars.

THE PHILADELPHIA & READING is inquiring for 40 steel suburban coaches and 10 steel suburban combination coach and baggage cars.

THE CENTRAL VERMONT has ordered two steel 55-ft. combination passenger smoking and baggage storage battery cars, equipped with Edison batteries, from the Railway Storage Battery Car Company, New York.

Iron and Steel

THE WABASH is inquiring for 2,500 tons of structural steel.

THE CENTRAL OF GEORGIA is inquiring for 625 tons of structural steel.

THE CHESAPEAKE & OHIO is inquiring for 150 tons of structural steel.

THE BALTIMORE & OHIO is inquiring for 10,000 tons of structural steel.

THE MISSOURI-KANSAS-TEXAS is inquiring for 1,400 tons of structural steel.

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for 3,500 tons of structural steel.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE is inquiring for 500 tons of structural steel.

THE MISSOURI PACIFIC is inquiring for 100 tons of structural steel for a 100 ft. turntable.

THE UNION PACIFIC is inquiring for 175 tons of structural steel for five deck plate girder spans.

THE GREAT NORTHERN has ordered 920 tons of structural steel for bridges at Minot, N. D., and Des Lacs from the Milwaukee Bridge Company.

Recent orders for rail placed with the United States Steel Corporation interests include 15,000 tons for the Nashville, Chattanooga & St. Louis, 5,000 for the Carolina, Clinchfield & Ohio, 10,000 for the Texas & Pacific, 6,000 for the St. Louis-San Francisco and 4,000 for the St. Louis, Brownsville & Mexico.

Machinery and Tools

THE SOUTHERN PACIFIC has placed an order for a 36 in. by 18 ft. lathe, and for an axle lathe.

THE CENTRAL VERMONT has placed an order for a 36 in. by 17 ft. lathe, also for a 5 ft. radial drill.

THE ELGIN, JOLIET & EASTERN has ordered one turret lathe from William Powell Company, Cincinnati, Ohio.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE is inquiring for one cutoff saw to cut 10 in. square material, one No. 3 hand saw, one rip saw, to handle 8 in. by 16 in. material, one double cylinder planer, to handle 12 in. material, one combination automatic car gainer, one vertical and horizontal chisel mortiser, with vertical car borer attached, having a traveling carriage 40 ft. long.

Signaling

THE NEW YORK CENTRAL has ordered from the General Railway Signal Company an electric interlocking machine, 41 working levers, for installation at Bay View, N. Y.

THE PENNSYLVANIA has ordered from the General Railway Signal Company an electric interlocking machine, Model 2, 18 working levers, for installation at Indiana Harbor, Ind.

THE UNION PACIFIC has ordered from the General Railway Signal Company an electric interlocking machine, 16 working levers, Model 2, together with 12 signals and other apparatus, for installation at Provo, Utah.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has ordered from the General Railway Signal Company an electric interlocking machine, with a 48-lever frame, for installation at Lenox, Ill.

THE NORTHERN PACIFIC has ordered from the General Railway Signal Company an electric interlocking machine, 48-lever frame, for installation at Eighteenth avenue, Minneapolis, Minn., together with 15 signals, 20 switch machines and other apparatus.

Miscellaneous

THE NEW YORK, NEW HAVEN & HARTFORD will receive bids until 12 o'clock noon, October 1, at New Haven, Conn., for its requirements of locomotive and car couplers during the remainder of the year 1923.

Supply Trade News

The Superheater Company is preparing plans for the erection of a 120-ft. by 210-ft. addition to its plant at East Chicago, Ind., to cost approximately $75,000.

C. F. McCuen, representative of the W. H. Miner Company, with headquarters at Chicago, has been appointed general sales agent of the **Camel Company,** with the same headquarters.

The Prime Manufacturing Co., Milwaukee, Wis., contemplates the erection of a modern brass foundry of approximately 15,000 to 18,000 sq. ft. No definite plans have as yet been made.

S. G. Eastman, western sales manager of the **Niles-Bement-Pond Company,** with headquarters at San Francisco, Cal., has been transferred to Chicago, to succeed G. F. Mills, Chicago sales manager, retired.

W. M. Bosworth has resigned as mechanical engineer of the Wine Railway Appliance Company, Toledo, Ohio, and is now affiliated with the Met'l Fibre Rope Company, Toledo, as vice-president and factory manager.

Fairbanks, Morse & Co. have purchased a tract of land formerly owned by the county workhouse at Indianapolis, Ind., and are planning to erect a new factory building adjoining the present plant, which covers 4½ acres.

J. D. Phillips has been appointed office manager of the new Oakland, Cal., plant of the **General Electric Company.** Mr. Phillips, who was formerly traveling auditor, will have charge of accounting, statistics, payrolls and all clerical operations at these works.

J. A. Queeny, for many years special representative of the railway department of the General Electric Company, Schenectady, N. Y., resigned on September 1, to become assistant to T. E. Mitten, chairman of the board of the **Philadelphia Rapid Transit Company.**

The Prest-O-Lite Company, Inc., has received an order for complete storage battery equipment of type 7, K R L B, to be installed on the New York Central in connection with installation of Hall color light signals between Amboy, N. Y., and Lyons, a distance of 40 miles.

N. B. Norris has been appointed manager of the New Orleans, La., office at 938 Whitney-Central building, of the **Pawling & Harnischfeger Co.,** Milwaukee, Wis. This company has opened a new office at 1124 Book building, Detroit, Mich., with **James Van Buskirk** in charge.

The Sullivan Machinery Company, Chicago, held a picnic on August 11 at Michigan City, Ind., to commemorate the opening of its new western works at that place. Addresses were made by F. K. Copeland, president of the Sullivan Machinery Company and by the president of the Chamber of Commerce of Michigan City.

The Consolidated Car-Heating Company, Albany, N. Y., has secured the patents, equipment, good-will and other assets of the Automatic Ventilator Company of New York City. The Consolidated Car-Heating Company is now prepared to fill orders for all types of automatic ventilators heretofore supplied by the Automatic Ventilator Company.

Orlando Metcalf, vice-president of the Anchor Company, with headquarters at Chicago, died on July 28 from pneumonia. From 1904 to 1910, he was western manager of the Verona Tool Works, with headquarters at Chicago and from the latter date until 1922, he was engaged in the rail anchor business. In 1922 he organized the Anchor Company.

After October 1, the Michigan office of the **Truscon Steel Company,** Detroit, Mich., will be located in its new building at 615 Wayne street, Detroit, occupying the entire second floor. The office includes a complete service organization and engineering department. The general advertising department of the company will also be located on the same floor with the Michigan office.

Walter A. Deems has been appointed representative of the machine tool department, New York district, of **Manning, Maxwell & Moore, Inc.,** with headquarters at 100 East Forty-second street, New York City. For the past ten years Mr. Deems served as master mechanic of the Baltimore & Ohio's New York Terminals and the Staten Island Rapid Transit Company, with headquarters at Tompkinsville, Staten Island, resigning on September 15, to go with Manning, Maxwell & Moore, Inc.

The J. W. Griffin Lumber Company, of Burnside, Miss., has sold to the **Reynolds-West Lumber Company** 300,000,000 ft. of long and short leaf pine located near Burnside. **P. J. M. Reynolds** is president of the new company and **J. M. West** is vice-president. **M. P. Barton,** until recently with the Peavy Byrnes Lumber Company, will be manager of the Burnside mill. Plans for the future contemplate the construction of a new hardwood mill to be built by the Reynolds-West Lumber Company at Burnside this year.

Exum M. Haas has resigned as manager of the railroad department of the H. K. Ferguson Company, Cleveland, Ohio, to open an office as consulting engineer at 2075 Taylor Road, Cleveland, Ohio. Mr. Haas will retain a connection with the Ferguson Company as consulting engineer on railroad projects and will specialize in railroad shop and terminal planning. He has been engaged in this phase of railway construction since 1917, having served as sales engineer for the Austin Company for three years and since August 1, 1920, as manager of the railroad department of the H. K. Ferguson Company.

The Train Control Corporation of America has been organized with headquarters at 1409 Grand Central Terminal, New York City. **F. B. Lincoln** is president and general manager, **Col. H. B. Hunt,** director supervising manufacturing and air brake engineering, **George Sergeant, Jr.,** director supervising contracts and installation and **Bruce J. Delette** is secretary and treasurer. The corporation has taken over the Clifford Automatic Train Stop Company, proprietor of the Clifford automatic train stop. The company has a branch office in Scranton, Pa., and an engineering office at Port Jervis, N. Y. Preparations are being made for a test of the Clifford devices on the Erie near Port Jervis.

Appreciation for Green and Ostrander

A representative group of railroad and railway supply men, at a luncheon at the Railroad Club of New York, Friday, September 14, gave a rousing reception to Fred Green, who has just returned from a four-years' stay in South Africa as a representative of the Baldwin Locomotive Works, and to A. E. Ostrander of the American Car & Foundry Company, who has returned in splendid health from a year and a half in the far west.

The luncheon, which was presided over by F. H. Hardin, chief engineer of motive power and rolling stock, New York Central, included about 70 persons. W. H. Woodin, president of the American Car & Foundry Company, paid a splendid tribute of appreciation to Mr. Ostrander. James McNaughton, vice-president of the Baldwin Locomotive Works paid a similar tribute to Mr. Green, as did also Herman Westinghouse of the Westinghouse Air Brake Company, with which company Mr. Green was formerly associated. Frank Hedley, president of the Interborough Rapid Transit Company, commented upon the achievements of the two guests of honor and welcomed them back to New York. Mr. Green and Mr. Ostrander made appropriate responses.

THE INTERNATIONAL-GREAT NORTHERN has appealed to the United States Supreme Court from the decree of the Federal court at Houston, Tex., dismissing the road's suit to restrain the city of Palestine, Tex., from forcing the retention of the road's shops in that city. The plan of the railroad is to move its principal shops from Palestine to Houston. This proposal has met with strenuous opposition from the city of Palestine.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company, through the El Dorado & Santa Fe Construction Company, which is building a new line from El Dorado, Kan., to Ellinor, has purchased a 200-acre tract near Cassoway, Kan., as the site for a 800,000,000 gal. storage reservoir. Plans include the construction of a concrete dam on the Walnut river to be 2,200 ft. long with a 250 ft. spillway.

ATCHISON, TOPEKA & SANTA FE.—This company has awarded a contract to the Watson Construction Company, Dallas, Tex., for the construction of a 19-story steel and concrete office building, a 10-story brick and steel warehouse and two, 8-story brick and steel warehouses at Dallas, Tex. The office building will be 200 ft. by 135 ft. and will contain display rooms and offices for supply companies as well as general offices for the road. The 10-story warehouse will have 335,290 sq. ft. of floor space and will be occupied by transfer and dry storage companies. One 8-story warehouse will be 245 ft. by 100 ft. and will be used for the handling of merchandise. The third warehouse will be 171 ft. by 150 ft. and will be devoted to cold storage commodities. The total cost of the project is estimated at $5,000,000.

COLORADO, COLUMBUS & MEXICAN.—The Interstate Commerce Commission has made public a tentative report of Examiners Agate and Gray recommending a denial of this company's application for a certificate of public convenience and necessity for the construction of some 600 miles of line in New Mexico, Texas and Arizona. The company had proposed to build a main line of 395 miles from the Mexican boundary near Columbus, N. M., with branches making an estimated total of 550 miles, and had also proposed to build 1,200 miles in Mexico. It was proposed to finance the construction by the sale of $20,000,000 of 5 per cent bonds and the estimated cost as set forth in the application was $12,323,658. The report says that location surveys have been made for less than one-third of the route, the estimated cost was based on pre-war prices and very incomplete examination of the country, and that the mileage estimated at 550 miles would probably reach 575 or 600 miles. The conclusion of the examiners was "that the project has not been well studied, that the engineering conditions are not sufficiently known, that the construction cost has been much underestimated, that the financial plan is unsound, that the line would have no considerable value as a through route, that it would not have enough traffic to justify its construction in whole or in part, and that no certificate should be granted."

HOUSTON BELT & TERMINAL.—This company has awarded a contract to List & Gifford, Dallas, Tex., for the construction of a car classification yard at Houston, Tex., to cost $121,000.

LOUISIANA RAILWAY & NAVIGATION COMPANY.—This company has been ordered by the Louisiana Public Service Commission to construct a new freight and passenger station at Mansura, La. The plans for the building are to be completed within 90 days.

MISSOURI PACIFIC.—This company plans the construction of a branch from Charleston, Ark., to coal fields in that vicinity, a distance of approximately four miles.

MOFFAT TUNNEL.—The Moffat Tunnel Commission has rejected all bids submitted for the construction of a tunnel through the continental divide west of Denver, Colo., reported in the *Railway Age* of September 1, and has invited all bidders to submit offers on the project on a "cost plus" basis.

NEW YORK, CHICAGO & ST. LOUIS.—This company plans the construction of a new repair shop and other terminal facilities at West Frankfort, Ind., in addition to the roundhouse, reported in the *Railway Age* of September 1.

PRESCOTT & NORTH WESTERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension from Prescott, Ariz., for a distance of 26 miles in Nevada County.

SOUTHERN PACIFIC.—This company will construct a one-story freight car repair shop and wheel shop at Brooklyn, Ore.; an addition to its steel foundry at the Sacramento, Cal., shops to cost $30,000, with a new woodworking plant and planing mill to cost $210,000 with machinery, and an acetylene generating plant to cost $50,000; and a new power plant at San Luis Obispo, Cal., to cost $50,000.

SOUTHERN PACIFIC.—This company is constructing rock crushing plants at Santa Margarita, Cal., Palisade, Nev., and Lucin, Utah, the total cost of which will be approximately $600,000. This company is also extending its yard tracks and rearranging its main track at Nutglade, Cal., at a cost of $110,000. A line change of more than one-half mile is being made near Mott, Cal., at a cost of $135,000. Another line change costing $110,000, which involves the construction of a mile of new track, is being made near Crockett, Nev.

SOUTHERN PACIFIC.—This company has been ordered by the Louisiana Public Service Commission to construct new umbrella type train sheds with a total length of approximately 350 ft. at its passenger station at Lake Charles, La.

SOUTHERN PACIFIC.—This company is preparing plans for a new passenger station at Redlands, Cal., to cost approximately $200,000.

SPOKANE, PORTLAND & SEATTLE.—This company will construct a new blacksmith shop, 50 ft. by 90 ft., at Vancouver, Wash., to cost $30,000.

UNION PACIFIC.—This company has awarded a contract to the Campbell Construction Company, Ontario, Cal., for the construction of a reinforced concrete packing house at Ontario, Cal., to cost approximately $48,000.

WABASH.—This company will construct extensions to its tracks near St. Louis, Mo., at a cost of approximately $139,000. Included in the project is a 2½-mile spur track from the main line at Granite City, Ill., to the plant of the St. Louis Coke & Chemical Company.

WACO, BEAUMONT, TRINITY & SABINE.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension from Livingston to Beaumont, Port Arthur, and West Port Arthur, Texas. The total distance is 101.1 miles, of which it is proposed to construct 80.94 miles and secure trackage rights for 20.16 miles, if possible, over the Gulf, Colorado & Santa Fe and the Beaumont, Sour Lake & Western.

WESTERN FRUIT EXPRESS.—This company will construct a general car repair shop at St. Paul, Minn., to cost approximately $150,000.

Signaling for New Subway at New York

The New York Rapid Transit Corporation (formerly the Brooklyn Rapid Transit Company) has ordered from the General Railway Signal Company apparatus for the complete signaling of a subway now under construction in Fourteenth street, Manhattan, New York, extending from Sixth avenue on the west to Montrose avenue, Brooklyn (running beneath the East River), approximately four miles, double track. This contract includes 46 color light signals, automatic, 3 indication; 19 color light signals interlocked; 64 automatic electric trips (automatic train stops), and 4 interlocking plants. The interlocking plants are Model 2, unit lever type, with Model 5 switch machines. The interlockings are at Sixth avenue, Third avenue, Bedford avenue and Montrose avenue. The last named is at the end of the line and is to be arranged for automatic operation, controlled by the use of track circuits.

The illuminated diagrams at Sixth avenue, Third avenue and Bedford avenue will each be arranged to repeat all track circuits on the entire line. All interlocking plants will be equipped with complete route, sectional and approach locking. There will be two feeder lines throughout the length of this installation, one for ordinary use and the other to serve in case of emergency. These feeder lines will be installed by the Rapid Transit Corporation's forces, but all of the other work is to be done by the signal company.

Other special features of this installation include: a-c, 110-volt, dynamic indication interlocking; automatic means for feeding from a duplicate power line in case of failure of the regular power supply, and speed control signals to restrict speed on curves.

Railway Financial News

BONHOMIE & HATTIESBURG SOUTHERN.—*Asks Authority to Operate Line*—This company has applied to the Interstate Commerce Commission for authority to acquire and operate that part of the Hattiesburg branch of the Gulf, Mobile & Northern extending from Beaumont to Hattiesburg, Miss., 25.95 miles.

BOSTON & MAINE.—*P. R. R. Not Seeking Control.*—The Pennsylvania Railroad is not seeking control of either the New Haven or the Boston & Maine Railroads, President Samuel Rea stated in a telegram to Edward F. Brown, president of the Boston & Maine Stockholders' Protective Association, who has requested proxies. The message to Mr. Brown states:

> A stockholder of the Boston & Maine has sent me a copy of your circular of August 25, which contains the statement that the Boston & Maine is threatened with resumption of New Haven-Pennsylvania control. I beg to advise you that the Pennsylvania Railroad has neither directly nor indirectly sought in any way to control either the Boston & Maine or the New Haven. Therefore, statements contained in your circular are without foundation, and, as I see it, you are requesting proxies under false promises.
>
> Please correct situation at once by means similar to that which you have taken to spread this misinformation. The Pennsylvania Railroad wishes the New Haven and the Boston & Maine all prosperity, and has given it large amounts of traffic, directly and through connecting lines. The Pennsylvania Railroad does not wish to be placed in a false position before the people of New England and Boston & Maine stockholders.

CHICAGO, MILWAUKEE & ST. PAUL.—*Authorized to Abandon Branch.*—This company has been authorized by the Interstate Commerce Commission to abandon the operation of a branch line from Cogswell to Harlem, N. D., 5 miles.

GREAT NORTHERN.—*Asks Authority for Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $8,625,000 of 5 per cent equipment trust certificates in connection with the purchase of 58 locomotives and 3,125 freight cars. It is proposed to sell the certificates to the First National Bank, New York, at not less than 94.

KEOKUK & DES MOINES.—*Lease to Be Sought.*—The stockholders at their annual meeting on October 4 will authorize the refunding or renewal of the first mortgage 5 per cent bonds of the company, which will fall due on October 1. They will also vote for the renewal of the charter of the company, which expires on or about December 31, 1923, and for the lease of the property on favorable terms. The Rock Island Company has informed the company that it does not propose to renew the lease it has on the road, which will expire with the expiration of the charter. The bonds are outstanding to an amount of $2,750,000.

LONG ISLAND.—*Equipment Trust Certificates Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $1,710,000 of equipment trust certificates to be sold at not less than 95.

LOUISVILLE & NASHVILLE.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $15,862,000 of first and refunding mortgage 5 per cent gold bonds to be exchanged for a like amount of bonds now held in the treasury, and also the sale of $14,000,000 of the new bonds at not less than 93, the proceeds to be used for corporate purposes. Arrangements had been made to sell the bonds to J. P. Morgan & Co.

Equipment Trust Certificate Authorized.—The Louisville & Nashville has been authorized by the Interstate Commerce Commission to assume obligation and liability in respect of $6,000,000 of equipment trust certificates to be sold at not less than 96.

MINNEAPOLIS & ST. LOUIS.—*Not to Deposit Bonds.*—Holders of first and refunding 4 per cent bonds have received a circular stating that the Connecticut savings banks and insurance companies of Hartford would not deposit their holdings of this issue with the committee formed for its protection, of which J. S. Bache is chairman. This circular is printed over the names of P. LeRoy Harwood, president of the Connecticut Savings Bank Association, and James Lee Loomis, vice-president of the Connecticut Mutual Life Insurance Company. It states that the institution mentioned holds approximately $2,500,000 of these bonds. The circular adds that these institutions will not deposit their bonds because of the conflicting interests involved in the reorganization of the company, which is now in receivership. The neutrality, it is said, will be maintained until some agreement is reached or the various issues raised are clarified.

PENNSYLVANIA.—*President Rea Denies Control Is Sought.*—*See Boston & Maine.*

POTEAU & CAVANAL MOUNTAIN.—*Authorized to Acquire and Operate Road.*—This company has been authorized by the Interstate Commerce Commission to acquire and operate a line extending from Poteau to a point near Witteville, Okla., 3½ miles, formerly owned by the Fort Smith, Poteau & Western.

READING COMPANY.—*Stockholders' Committee Dissolves.*—Holders of the first and second preferred stock have been advised that the committee formed to protect their interests has dissolved. The members of the committee were: Adrian Iselin (chairman), of A. Iselin & Co., Robert R. Dodson and Edwin G. Merrill, president of the Bank of New York and Trust Company. In explaining the reason for dissolving, the committee said that its work had been accomplished by the decree of the District Court on June 28, 1923, and that the stockholders' rights had been permanently secured.

SEABOARD AIR LINE.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $809,000 of first and consolidated mortgage 6 per cent bonds to be pledged with the Secretary of the Treasury as part security for a loan from the government.

Treasury May Return Part of Collateral Held as Security

The Treasury may return to a railroad part of the collateral held as security for a loan made under the terms of the transportation act without exacting payment of any part of the principal, upon a finding by the Interstate Commerce Commission that the release is warranted, according to an opinion submitted by the Department of Justice to the Secretary of the Treasury. The secretary had asked an opinion as to whether he was authorized to release $257,000 out of a total of $1,030,000 of first mortgage bonds pledged by the Gulf, Mobile & Northern as collateral for a loan of $515,000. The opinion holds that if the commission finds that the release of part of the security is desirable to enable the railroad to provide itself with additional funds and that the security retained is sufficient to protect the government, the discretion given to the Treasury Department by the law is sufficient to authorize it.

Trend of Railway Stock and Bond Prices

	Sept. 18	Last Week	Last Year
Average price of 20 representative railway stocks	59.06	61.29	73.45
Average price of 20 representative railway bonds	81.95	82.55	89.80

Dividends Declared

Cleveland, Cincinnati, Chicago & St. Louis.—Common, 1 per cent, quarterly; preferred, 1¼ per cent, quarterly; both payable October 20 to holders of record September 28.

Kansas City Southern.—Preferred, $1.00, quarterly, payable October 15 to holders of record September 29.

Minneapolis, St. Paul & Sault Ste. Marie Leased Lines.—$2.00, semi-annually, payable October 1 to holders of record September 20.

New York Central.—1¾ per cent, quarterly, payable November 1 to holders of record September 28.

Philadelphia & Western.—Preferred, 1¼ per cent, payable October 15 to holders of record September 29.

Reading Company.—Common, 2 per cent, quarterly, payable November 8 to holders of record October 16; 2nd preferred, 1 per cent, quarterly, payable October 11 to holders of record September 25.

Western Pacific.—Preferred, $1.50, quarterly, payable October 22 to holders of record October 11.

CRUCIFYING THE RAILROADS or shooting them at sunrise or turning them over to government operation will not alter the fact that wheat went down 10 to 15 cents a bushel in a year and corn went up approximately 20 to 25 cents in the same time and under precisely the same transportation conditions.—Urbana (Ill.) Courier.

Railway Officers

Executive

J. G. Kerr, whose promotion to senior assistant to the vice-president of the Lousiville & Nashville, with headquarters at Louisville, Ky., was reported in the *Railway Age* of September 15, was born on May 11, 1886, at Jeffersonville, Ind. He entered railway service on August 15, 1903, as a stenographer in the freight claim department of the Louisville & Nashville, at Louisville, Ky., and later served successively as claim investigator, rate clerk and in various supervisory positions in the general traffic department. On October 18, 1918, he was appointed traffic assistant to the director of traffic of the United States Railroad Administration at Washington, D. C., specializing in rate litigation. At the termination of Federal control on March 1, 1920, he returned to the service of the Louisville & Nashville as junior assistant to the vice-president in charge of traffic and on December 1, 1920, was promoted to assistant general freight agent, with headquarters at Louisville. Mr. Kerr held this position until September 1 of this year when he was promoted to senior assistant to the vice-president in charge of traffic, with the same headquarters.

J. G. Kerr

Operating

H. C. Thompson has been appointed acting trainmaster of the Southern Pacific, San Joaquin division, with headquarters at Mojave, Cal., succeeding J. B. Wilson, resigned.

J. L. Clark and **W. J. Sherwood** have been appointed assistant trainmasters of the Sacramento division of the Southern Pacific, with headquarters at Sacramento, Cal.

G. H. Minchin, acting division superintendent of the Illinois division of the Atchison, Topeka & Santa Fe, with headquarters at Chillicothe, Ill., has been promoted to superintendent, with the same headquarters.

J. J. Foley, division freight and passenger agent for the Chicago, Milwaukee & St. Paul, with headquarters at Miles City, Mont., has been appointed general manager of the new Montana railroad and the Wyoming North & South, with headquarters at Sheridan, Wyo.

A. L. Robinson, assistant to the general superintendent of the Wabash, with headquarters at St. Louis, Mo., has been promoted to the new position of assistant to the general manager, with duties in connection with labor questions, with the same headquarters.

T. J. Jones, general superintendent of the Wabash, with headquarters at St. Louis, Mo., has been appointed general superintendent of the newly created Eastern district, with the same headquarters. The Eastern district will include the Buffalo, Detroit Terminal, Detroit, Peru, Decatur and Chicago Terminal divisions. **E. A. Sollitt,** superintendent of the Peru division, with headquarters at Peru, Ind., has been promoted to general superintendent of the newly created Western district, with headquarters at St. Louis, Mo. The Western district will include the St. Louis Terminal, Springfield, Moberly and Western divisions. **W. H. Eckard,** superintendent of the Moberly division, with headquarters at Moberly, Mo., has been transferred to the Peru division, with headquarters at Peru, Ind., succeeding Mr. Sollitt. **C. B. Davidson,** superintendent of terminals at Kansas City, Mo., has been promoted to superintendent of the Moberly division, with headquarters at Moberly, Mo., succeeding Mr. Eckard.

A. T. Lowmaster, whose appointment as assistant superintendent of transportation of the Chesapeake & Ohio, with headquarters at Richmond, Va., was announced in the *Railway Age* of August 4, page 229, was born at McCutchensville, Ohio, on August 29, 1882, and was educated at high school and business college. He entered railway service in 1900 as a clerk and chore boy in the office of the master carpenter of the Erie at Huntington, Ind. In 1903 he was promoted to clerk to the division engineer at the same point. A year later he was transferred to the trainmaster's office at Huntington and in 1906 went to Chicago as a voucher and statistical clerk in the office of the general agent. In 1910 he was promoted to chief clerk in this office and the following year became chief clerk to the superintendent of terminals and construction of the Chesapeake & Ohio at Chicago. From 1912 to 1916 he was general agent for this road at Chicago and was then appointed superintendent of terminals. In 1917 he was promoted to assistant superintendent of transportation, with headquarters at Richmond, in which position he was serving at the time of his recent promotion.

Foster Studio, Richmond, Va.

A. T. Lowmaster

Traffic

F. E. Watson, whose promotion to general passenger agent of the Southern Pacific, with headquarters at Los Angeles, Cal., was reported in the *Railway Age* of August 11, was born on December 19, 1885, at Kirkwood, Ill. He entered railway service in May, 1905, as telegrapher and assistant agent on the Southern Pacific at McMinnville, Ore., and during the next four years served in various capacities on the lines in Oregon. In October, 1911, after being out of railway service for two years, he returned to the Southern Pacific as a telegrapher on the Los Angeles division. He was promoted to agent at Pasadena, Cal., in May, 1912, and in August of the following year was promoted to city passenger agent at Los Angeles, Cal. He was promoted to commercial agent at Pasadena in August, 1915, and resigned in July, 1918, to enter the engineer corps of the United States Army, with a commission as first lieutenant. While in service overseas, Mr. Watson was assigned to the transportation corps in charge at Rouen as railway transportation officer and assistant provost marshall, later serving as railway transportation officer at LeHavre. In August,

F. E. Watson

1919, he returned to the Southern Pacific as acting district passenger agent, with headquarters at Los Angeles, and was promoted to assistant general passenger agent on March 1, 1920. Mr. Watson was serving in this capacity at the time of his recent promotion to general passenger agent, with headquarters at Los Angeles.

J. T. Saunders, whose promotion to assistant freight traffic manager of the Southern Pacific, with headquarters at Los Angeles, Cal., was reported in the *Railway Age* of August 11, was born on May 25, 1884, at Fort Worth, Tex. He entered railway service in December, 1903, with the Southern Pacific as stenographer to the chief clerk in the passenger department, after which he was successively promoted to contracting freight agent, correspondence secretary to the assistant general freight and passenger agent, chief clerk in the general freight office and industrial agent at Los Angeles. He was promoted to assistant general freight agent, with headquarters at San Francisco on June 1, 1916, and was again promoted to general freight agent, with headquarters at Los Angeles, on December 1, 1921. Mr. Saunders was holding this position at the time of his recent promotion to assistant freight traffic manager, with the same headquarters, which position is a newly created one.

J. T. Saunders

E. C. Patton has been appointed city freight service agent of the Louisville & Nashville with headquarters at Nashville, Tenn., succeeding **R. A. Stanley,** promoted.

F. S. McGinnis, whose promotion to assistant passenger traffic manager of the Southern Pacific, with headquarters at Los Angeles, Cal., was reported in the *Railway Age* of August 11, was born on January 25, 1883, at Los Angeles, Calif. He entered railway service in September, 1900, as an office boy in the freight house of the Southern Pacific at Los Angeles, later serving successively as Pullman clerk, ticket clerk and cashier in the city ticket office at the same place. He was then promoted to city passenger agent at Los Angeles, and a short time later was promoted to commercial agent at Pasadena, Calif. Mr. McGinnis was subsequently promoted to district passenger agent, with headquarters at Los Angeles, and in April, 1915, was promoted to general passenger agent, with the same headquarters. He held this position until August 1 of this year, when he received his promotion as assistant passenger traffic manager, with headquarters at Los Angeles, which is a newly created position.

F. S. McGinnis

George R. Cobbett has been appointed traveling freight agent of the Kansas City Southern with headquarters at Pittsburgh, Pa., succeeding H. J. O'Connor, resigned. **Don J. Ramsey** has been appointed traveling freight agent with headquarters at Chicago, Ill. **C. L. Weeks** has been appointed soliciting freight agent with headquarters at Chicago, and **W. W. Blackman** has been appointed soliciting freight agent with headquarters at Shreveport, La.

F. M. Miller has been appointed general agent, freight department of the Western Pacific, with headquarters at Los Angeles, Cal.

Mechanical

J. W. Highleyman, superintendent of shops of the Union Pacific, with headquarters at Cheyenne, Wyo., has been promoted to assistant superintendent of motive power and machinery, with headquarters at Omaha, Neb.

Walter A. Deems, for the past ten years master mechanic of the Baltimore & Ohio, New York Terminal Lines, and the Staten Island Rapid Transit Company with headquarters at Tompkinsville, Staten Island, N. Y., has resigned to engage in other business.

Engineering, Maintenance of Way and Signaling

J. A. Reed, acting division engineer of the Southwestern division of the St. Louis-San Francisco, with headquarters at Sapulpa, Okla., has been appointed division engineer, with the same headquarters, succeeding **J. G. Taylor,** who has been assigned to other duties.

C. B. Pettigrew, division engineer of the Northern division of the St. Louis Southwestern, with headquarters at Pine Bluff, Ark., has been promoted to division superintendent, with the same headquarters, succeeding **D. W. Bowker,** whose death on September 8 was reported in the *Railway Age* of September 15.

Purchasing and Stores

C. C. Dibble, supervisor of stores of the New York Central with headquarters at Indianapolis, Ind., has been appointed general supervisor of stores with the same headquarters. The position of supervisor of stores has been abolished.

Special

W. H. Swift, Jr., has been appointed radio engineer of the Canadian National with headquarters at Montreal, Quebec.

Obituary

Victor J. Bradley, chief of the mail service and traffic of the Pennsylvania with headquarters at Philadelphia, Pa., died from heart disease on a passenger train en route from the Broad Street Station, Philadelphia, to his home in Overbrook, Pa., on September 15. Mr. Bradley was born in 1858 in New York City and received his early education there and was later graduated from the De La Salle College, New York City. In 1881 he was appointed superintendent of the second division of the United States railway mail service at New York city, which position he held for thirty years. During the later part of 1911 he was appointed chief of the mail service and traffic of the Pennsylvania, which position he held at the time of his death.

V. J. Bradley